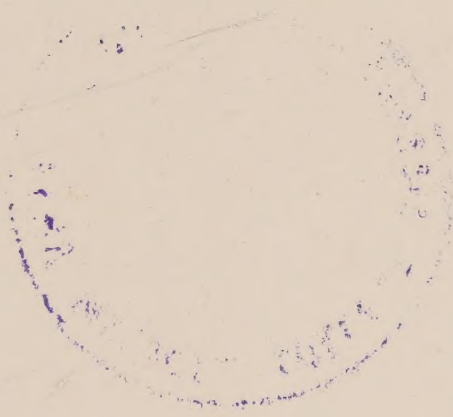


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1. *Algiers*

B.R. 505 A (RESTRICTED)
GEOGRAPHICAL HANDBOOK SERIES
FOR OFFICIAL USE ONLY

ALGERIA

VOLUME II

MAY 1944

NAVAL INTELLIGENCE DIVISION

*This book is for the use of persons in
H.M. Service only and must not be shown,
or made available, to the Press or to any
member of the public.*

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Information subsequent to the Allied landings
in French North Africa is generally excluded
from this volume.

PREFACE

IN 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand it has become apparent that something more is required to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities, and working at sub-centres established at Oxford and Cambridge, and is printed by the Oxford and Cambridge University Presses. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed

first to provide, for the use of Commanding Officers, information in a comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, &c.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force, and other Government Departments (many of whom have given great assistance in the production of the series) will find these handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY

Director of Naval Intelligence

1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been prepared by the Oxford sub-centre of the Naval Intelligence Division under the direction of Lieut.-Colonel K. Mason, M.C., M.A., R.E., Professor of Geography in the University of Oxford, and is the work of a number of contributors, whose names are given on pages 454-455.

E. G. N. RUSHBROOKE

Director of Naval Intelligence

MAY 1944

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NOTE

English equivalents are normally given for all metric figures, with the exception of metric tons (1 metric ton = 0.984207 ton).

CHAPTER IX

ADMINISTRATION

POLITICAL ORGANIZATION

UNLIKE Tunisia and Morocco, which are protectorates administered by the French Foreign Office, Algeria is an integral part of France administered by the Ministry of the Interior, and sends representatives to the French Parliament. The gradual evolution of the present system of administration is briefly described in Vol. I, pp. 200–203. In the past there has been considerable conflict between the civil and military authorities. Civil rule, supported by the colonists, was associated with a policy of close attachment to France in contrast to military rule, which favoured greater autonomy, coupled with greater respect for the rights of the native and less encouragement for colonization. It was very largely the desire of the colonists to be administered by the home government rather than by the military authorities in Algeria that led to the present close connexion of Algeria with France.

Military and Civil Rule in Algeria, 1830–1870

Military rule, established between 1830 and 1848, was modified by the creation of new organs of civil government under the Second Republic in 1848. The newly formed departments of Oran, Algiers, and Constantine in northern Algeria were put under prefects, with general councils, and were given representation in the French Parliament. Justice and other services were detached from dependence on the Ministry of War and attached to the relevant French ministries in Paris.

Under the Second Empire (1852–1870) military rule was restored in its entirety, and a short-lived attempt to revive civil government under a special 'Ministry of Algeria and of the Colonies' between 1858 and 1860 resulted only in a strengthening of the military regime.

Administration since 1870

With the establishment of the Third Republic the supremacy of the civil authorities was assured. The direction of Algerian affairs was transferred from the Ministry of War to the Ministry of the Interior, and a civil governor, nominated on the advice of this

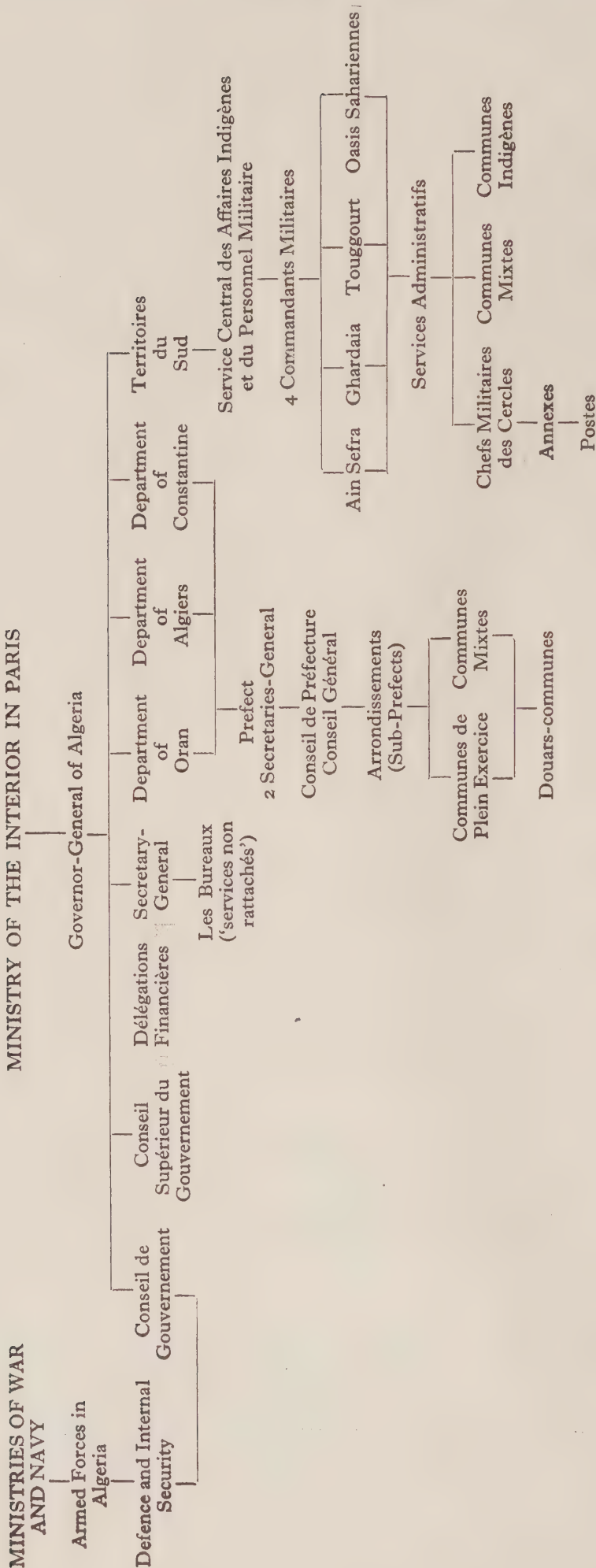


FIG. 1. The administrative organization of Algeria

Ministry by the President of the Republic, was instituted for the three departments of northern Algeria, where prefects were given authority over generals. The three departments were once more given representation in the French Parliament.

This triumph of the civil over the military authorities was followed in 1881 by the decree *de rattachement*, which completely assimilated Algeria to France, all Algerian services, even that of Moslem justice, being attached to the corresponding French services. This regime did not, however, prove satisfactory. The solution of vital problems was delayed indefinitely by Paris officials, who were ignorant of realities in Algeria; and in Algeria itself, where the Governor-General no longer had any real power but was merely a transmitting agent, there was no competent central authority to whom matters could be referred.

There was, therefore, a movement away from assimilation in the following decade, much encouraged by Jules Cambon, the Governor-General from 1891 to 1897. This movement was also supported by the colonists themselves, who were beginning to realize that the removal of military rule was not a panacea for all their ills. This led to the establishment between 1896 and 1902 of the present modified system of attachment to France.

Between 1892 and 1896 a Senatorial Commission, appointed to inquire into Algerian administration and presided over by Jules Ferry, published a series of reports advocating the suppression of *rattachement*. A little later the French Chamber of Deputies declared itself convinced that the *rattachements* were an obstacle to the efficient working of the Algerian public services, and by a decree of 1896 they were formally abolished. This empowered the Governor-General to centralize the higher administration under his authority. In 1898 further decrees were issued which laid the foundations of the present administrative system of Algeria.

From then until the establishment of the Vichy Government in 1940 the country was represented in the French Parliament, to which the three departments of northern Algeria sent ten deputies and three senators, chosen by the French citizens in the country. The department of Algiers was represented by four deputies and one senator, and each of the other departments by three deputies and one senator.

The administrative organization described below and illustrated diagrammatically in Fig. 1 is that existing up to the fall of France in June 1940: changes since that date are given on pp. 15-16.

The Governor-General

The Governor-General is the head of the administration in Algeria, though all decrees issued by him must have the authority of the French President, who still has power to legislate for Algeria. Nevertheless the Governor-General himself has control over all civil public services except the *services rattachés* of justice, education, and finance. Even over these he has considerable influence, particularly in the matter of appointments and of general financial control; the latter became very extensive after a separate budget had been instituted for northern Algeria in 1900, and after the creation of the separate administrative unit of southern Algeria or the Territoires du Sud in 1902. Although the administration of northern Algeria is entirely civil, while that of the Territoires du Sud is still predominantly military, the Governor-General remains the supreme authority in both parts of the country. His relations with the military authorities are regulated by decrees issued in 1901, 1916, and 1918. The decree of 1901 places Generals of Division under his immediate authority in administrative matters, and also declares that in time of peace he alone is responsible for measures relating to the internal security of Algeria and the policing of its frontiers, shores, and confines. The decrees of 1916 and 1918 declare that he is in principle alone responsible for measures necessary for the defence and security of Algeria. Article 4 of a law of 1878 gives him the right of declaring a state of siege in part or the whole of Algeria, should communications with France be interrupted.

Although the Governor-General is subordinate to the French Minister of the Interior and has no properly ministerial or legislative power, he has in fact very great powers, approaching those of a minister: these are much more extensive than his administrative functions alone suggest. He is the pivot of the whole highly centralized administration of Algeria, and it is only technically incorrect to say that his policy is the determining influence of the administration. Immediately under his authority are a civil cabinet, a military cabinet, and a 'Service central des Affaires indigènes et du Personnel militaire'. His second in command is the Secretary-General of the Government, who takes his place in case of absence. The central administration of the Government-General of Algeria is placed under the orders of the Secretary-General, and consists of the cabinets mentioned above and of the cabinet of the Secretary-General, together with the *bureaux* or the *services non rattachés*. These include the Direction

of the Interior; Financial services; Agriculture, Commerce, and Colonization; Public works; Railways; Native affairs; Posts, Telegraphs, and Telephones; and the Security services (Fig. 1).

Consultative Bodies

The administration of northern Algeria is not only highly centralized but essentially bureaucratic. It is also predominantly French in character, since there are no special provisions in Algeria for Europeans who are not French citizens, and the only large body of French citizens who are not Europeans consists of the Jews, who were automatically made citizens by the Loi Crémieux of 1870 (p. 49). In the central government there are three important consultative bodies—the Conseil de Gouvernement, the Conseil supérieur du Gouvernement, and the Délégations financières.

The *Conseil de Gouvernement* is a purely official and entirely French body composed of sixteen high officials, presided over and nominated by the Governor-General. It is a single consultative council and never transforms itself into an administrative tribunal like the Conseil d'État in France or the Conseils privés of French colonies. It usually meets once a week.

The *Conseil supérieur du Gouvernement* (created in 1870 and reorganized in 1898) is a semi-representative body in which non-official French elements predominate and in which there is also a small native element, mostly nominated. It consists of fifty-nine members, twenty-eight of whom are nominated and thirty-one elected: prior to the decree of 16 May 1907 there were sixty members (29 nominated). The nominated members consist of fourteen members of the Conseil de Gouvernement, and the Conservator of Forests, the three Generals of Division, the three prefects, four high Algerian officials, and three native notables chosen by the Governor-General. Those who are not *ex-officio* members of the Council are nominated for three years, and their term of office may be extended. The elected members consist of fifteen members of the Conseils généraux (p. 8) and sixteen members of the Délégations financières (12 from the two French delegations and 4 from the native delegation). The Council meets once a year in ordinary session and is presided over by the Governor-General; half the membership then forms a quorum and decisions are taken by the majority present.

The *Délégations financières* (created in 1898) are an entirely elected body functioning on a communal basis in which the natives have just under one-third of the seats. There are three delegations, two

French and one native. The first French delegation consists of twenty-four members representing the colonists: a 'colonist' is officially described in the decree of 1898 which brought the Délégations financières into being as 'tout concessionnaire ou propriétaire de biens ruraux, ainsi que tout chef d'exploitation ou fermier desdits biens'. The second French delegation consists of twenty-four representatives of French 'non-colonists' (i.e. traders, industrialists, workmen, &c.). The native delegation consists of twenty-one Moslem members, six of whom are Kabylies, who constitute a separate section. Each delegation, and also the Kabylie section, deliberates separately. The Governor-General can, however, authorize a special plenary session of all the delegates in order to discuss questions of common interest specified by him.

The methods of election to the delegations differ. The members of the French delegations are elected by a restricted suffrage. They must be twenty-five years of age, have resided for three years in Algeria, and have had French nationality for at least twelve years: in these ways it is ensured that they are people who know Algeria and have substantial interests in it, and are also of French nationality. The members of the native delegation, on the other hand, are nominated by native electors to the *communes de plein exercice* (p. 11), and by members of municipal councils and *djemaas* in the *communes mixtes* (pp. 11-12). The delegates are elected for six years, and half their number can be re-elected every three years.

The Conseil supérieur and the Délégations financières have been compared to embryonic upper and lower Houses of Parliament. In theory, however, they are not only purely consultative, but are supposed to have no political character, and to be concerned only with economic questions; and to underline this it is decreed that a delegate cannot be a senator or a deputy. Their special function, as explained below, is to vote the budget. They are also empowered to decide on the execution of public works and to make resolutions on financial and economic matters. All modifications in the financial regime of Algeria must be voted by them. The Conseil supérieur cannot increase credits voted by the Délégations financières or take the initiative in any new expenses, but it can reduce credits or reject them.

The power of the Délégations financières has tended to increase in recent years and by 1930 their influence on legislation and policy was an accepted fact. M. Viollette, Governor-General of Algeria from 1925 to 1927, tried to contain them within their legal attributes,

but his successor Bordes (1927-1930) no longer contested their ever-growing prerogatives.

Budget Control

The delegations derive most of their influence from their control of the budget. The law of 19 December 1900, which created a special budget for northern Algeria, gave the territory very extensive, though not complete, control over its own financial resources; at the same time it gave them the benefit of financial help from metropolitan France at the cost of some scrutiny and supervision. All Algerian receipts which formerly went to the French Treasury now figure in the Algerian budget, but all military expenses (except those of the gendarmerie) and all naval expenses and pensions are placed to the charge of France. In 1915 this arrangement was slightly modified, when Algeria began to contribute to the military expenses of the territory. The rate of this contribution has been fixed since 1920 at 6 per cent. of the ordinary budget for ten years. Expenses left entirely to the charge of the Algerian budget are divided into obligatory and optional expenses. The obligatory expenses, which can be neither reduced nor increased without the consent of the Algerian assemblies described above, consist of debt charges, the general expenses of the administration, the salaries of officials seconded from France, the expenses of the state police, the gendarmerie and the Garde républicaine mobile (pp. 21-22), and the expenses of Moslem services and Native affairs. The Algerian assemblies have complete control of the optional expenses; except in so far as these concern the expenses of personnel. There is a special arrangement for the guarantees of interest on the Algerian railways, described on p. 286. Further information regarding the budget is given on pp. 285-288.

The budget is prepared under the control of the Minister of the Interior by the Governor-General, who then presents it to the Délégations financières. There it is referred to a financial commission, on whose report the Délégations deliberate and vote in plenary session. The budget then comes before the Conseil supérieur. The expenditure is authorized by a decree of the Minister of the Interior; any creation or suppression of taxes must be decreed by the Conseil d'État; the levying (*perception*) of duties (*droits*), dues (*produits*), and revenues needs a French law. Surplus receipts constitute a reserve fund which, since 1904, has been placed entirely at the disposal of the Algerian Government.

Local Administration

The local government of northern Algeria is modelled on that of France. As in France, there are departments, arrondissements, and communes, with prefects, sub-prefects, and mayors. The similarity is, however, more apparent than real. In the first place, though the population is not always much greater in each unit than in France, the units themselves are larger. The departments are each about ten times the size of an average French department; the arrondissements are about the size of a French department; and the communes as large as most French arrondissements. Secondly, there is far more centralization in Algeria than in France; and thirdly, the elected elements, both in the communes and in the general councils which assist the prefects, have less power than in France, largely because of the problem of native representation. Since 1919 the municipal vote has been given to Moslems (other than French citizens) who have reached the age of twenty-five and have had two years' residence in a commune; and have also served in the armed forces or belong to one of the following categories: property owners (either landed farmers or business men inscribed on the roll of a commune for at least one year); employees of the State, a department, or a commune; holders of an old-age pension; members of a Chamber of Agriculture or Chamber of Commerce; holders of a diploma from a government school or of a university degree, or of a certificate of primary studies; those possessing a French or an authorized foreign decoration; or those who have obtained prizes in agricultural or industrial competitions. In this way the native element in local assemblies has ceased to be almost entirely nominated, but it still forms a small minority in all local assemblies, and the greater the native representation in them the less power these bodies usually have.

The Departments. At the head of each of the three departments of Algiers, Oran, and Constantine is a prefect (*préfet*), a political officer nominated by the Minister of the Interior and appointed by the President of the French Republic. He is assisted by two Secretaries-General—one for administration (as in France), and the other for native affairs and the police force—and by an advisory body (the *Conseil de Préfecture*). The prefect acts as the agent of the Government-General in enforcing the country's laws: he also conducts the general local administration of the department in conjunction with an elected general council (the *Conseil général*), and supervises

the activities of the subordinate units of administration, in particular those of the communes. The French members of these general councils are elected on a basis of universal suffrage by the French citizens of the department. The native members (who cannot have more than a quarter of the seats) are elected by the native electors of the communes de plein exercice and by the native members of the municipal councils in the communes mixtes.

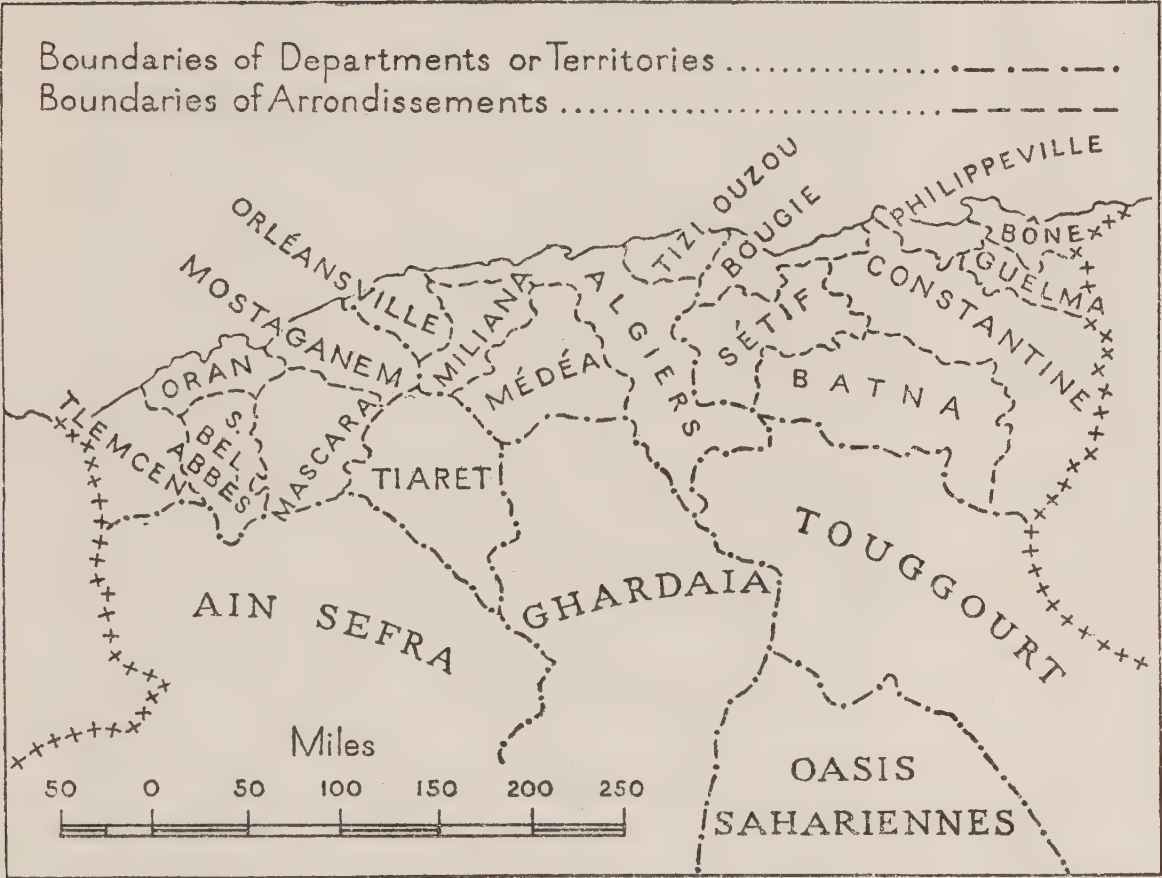


FIG. 2. The 'arrondissements' of northern Algeria and the 'territoires' of the Territoires du Sud

The Arrondissements. In the arrondissements the sub-prefect (*sous-préfet*) is the representative of the central authority, as the prefect is in the departments. Altogether there are eighteen arrondissements—five in the department of Algiers, six in Oran, and seven in Constantine. These are shown in Fig. 2, and are listed below. The arrondissement of Tiaret in the department of Oran was created by a decree of 8 March 1938, mainly out of the arrondissement of Mostaganem, though partly out of that of Mascara. No precise information as to its boundaries is available, and those shown in Figs. 2 and 3 are only approximate.



FIG. 3. The distribution of communes

Department of Algiers

Algiers
 Médéa
 Miliana
 Orléansville
 Tizi Ouzou

Department of Oran

Oran
 Mascara
 Mostaganem
 Sidi bel Abbès
 Tiaret
 Tlemcen

Department of Constantine

Constantine
 Batna
 Bône
 Bougie

Guelma
 Philippeville
 Sétif

The Communes. There are two kinds of communes: the communes de plein exercice (of which there are 308) in districts where there is a large European population, and the communes mixtes (of which there are only 78) where the natives are in the majority. Although the number of communes mixtes is small they cover five-sixths of the total area of the country and include three-quarters of the native population (Fig. 3). Each commune mixte has a population of between 20,000 and 30,000 with only a few hundred Europeans. Within both types of communes there are *douars-communes*, which are native tribal units with a recognized legal existence comparable, in some respects, to the French commune. Since 1919 they have elected councils or djemaas, which seem likely to play an increasingly important part in the political development of the natives.

The communes de plein exercice have powers approximating to those of a French commune. They have a mayor (*maire*) and an elected municipal council (*conseil municipal*) as in France, with the addition of native representation on the council when there are more than 100 natives in the commune. When the native population numbers more than 100 but less than 1,000, there are four Moslem members; and above 1,000 there is another Moslem member for every additional 1,000 natives. Natives can, however, have only one-third of the seats. They can participate in the election of, but cannot themselves act as, a mayor or a mayor's assistant. French members of the municipal council are elected by French citizens, and their numbers are fixed in proportion to the total European population of the commune.

The communes mixtes have far less independence than the communes de plein exercice. Real power is in the hands of the French administrator, who is nominated by the Governor-General and is

at once the mayor of the commune and an agent of the Government. He is assisted by a municipal council, the French membership of which is composed partly of his official assistants (*adjoints*) (one for each section of the commune) and partly of members (one for every 100 European inhabitants) elected by French citizens of the commune. Native members consist of the presidents of the *djemaas* in the *douars*, and of native *caïds* or chiefs nominated by the Governor-General.

Administrative Problems

The main administrative problem of northern Algeria is that facing any territory where there has been extensive European settlement, namely that of reconciling the demands of the settlers for self-government and representative institutions with the reluctance to grant similar privileges to the natives. The situation is complicated in Algeria by the close attachment of the country to France, for which the colonists were originally responsible, but which they are to-day anxious to weaken. They wish at the same time to strengthen their representative rights, particularly in the *Délégations financières*. It is significant that it is the natives, not the colonists, who now demand direct attachment to France, and with it the suppression of the *Délégations financières*.

The close attachment of Algeria to France has also caused native agitation for greater self-government to take the form of a demand for full French citizenship with all its accompanying political rights for the Moslem community, including that of sitting in the French Parliament as well as of having a greater share in local government. Since 1865, when all Algerian Moslems were declared French subjects without loss of 'personal statute' (i.e. civil and religious rights according to Moslem law), they have also had the option of becoming French citizens should they renounce their personal statute (Vol. I, p. 216). By 1938, however, less than 8,000 Moslems had availed themselves of this right. Laws of inheritance present one difficulty, but the most important obstacle is that of polygamy. In practice few Algerians can afford to be polygamous, but they regard polygamy as the touchstone of their religious liberties, and are also most unwilling to give up the closely dependent right to frequent and easy divorce. A law passed in 1919 gave automatic French citizenship to certain natives of more than twenty-five years of age, who had served in the War of 1914-1918, or were landowners or farmers, and who could read and write and were monogamous,

but because of this last provision the law had very little effect. The *Projet Viollette* introduced into the French Chamber in 1936 proposed that electoral rights should be given on equal terms with French citizens, but without loss of personal statute, to a small category of Moslems with high educational and property qualifications. This would have enfranchised only about 25,000 Moslems compared with the then French citizen electorate in Algeria of 250,000. Nevertheless the colonists saw in it the thin end of the wedge whereby the European element would eventually have been outvoted by the Moslem population, and opposed the measure so strongly that it had to be dropped. They were also afraid of the immediate consequences of the law. It was not that they feared native representation in the French Parliament, since this was, in any case, a matter of prestige rather than of power, but rather native participation in communal elections, where the law would have had the effect in many of the communes mixtes of immediately giving the Moslems a majority of the votes.

The only constructive alternative proposal put forward by the colonists was one for communal representation. This had, however, been expressly rejected by M. Viollette, the author of the project, on the ground that it ran counter to the French policy of assimilation, and it was unanimously rejected by the Moslems themselves.

The Administration of the Territoires du Sud

There is little in common between the administrations of southern Algeria and the three northern departments, except that, as shown diagrammatically in Fig. 1, they are united in a kind of personal union under the authority of the Governor-General. There are no departments and no prefects in the *Territoires du Sud*. There is some communal representation, but representative assemblies are very little developed, and administration is predominantly military in character, although the official title of southern Algeria is no longer '*Territoires militaires du Sud*' but '*Territoires du Sud*'.

In spite of the fact that the armed forces of Algeria depend directly on the Ministry of War in Paris, the Governor-General alone represents the Government in the *Territoires du Sud* as a whole. He has sole responsibility for the civil administration, where the powers appertaining to the prefects in northern Algeria devolve entirely upon him. In addition he disposes of all the troops stationed in southern Algeria, on condition only that he does not order them to leave their circumscriptions without previous authorization and gives

an account to the Government of such movements as he orders. The military commanders, who direct both military and administrative services, function directly beneath him under the control of the Service central des Affaires indigènes et du Personnel militaire (p. 4). There are four commands, shown in Fig. 2—Ain Sefra, Ghardaia, Touggourt, and the Oasis Sahariennes; these are subdivided into military *cercles*, *annexes*, and *postes*, the administration of which is entrusted to officers of the Service des Affaires indigènes (the modern name for the *bureaux arabes* described in Vol. I, p. 200). In addition there are communes mixtes and communes indigènes, distributed as follows:

<i>Territory</i>	<i>Chief town</i>	<i>Communes mixtes</i>	<i>Communes indigènes</i>
Ain Sefra	Ain Sefra	Ain Sefra Colomb Béchar Géryville Mechéria	La Saoura Touat-Gourara
Ghardaia	Laghouat	Laghouat Djelfa	Ghardaia
Touggourt	Touggourt	Touggourt Biskra El Oued	..
Oasis Sahariennes	Ouargla	..	Ouargla Tidikelt-Hoggar

The Saharan communes have a much more rudimentary organization than those of the northern departments. The mayor is always the officer commanding a cercle or annexe. In the communes mixtes there is a municipal council, the French members of which are officials and elected representatives of the local French citizens, while the native members are still partly nominated by the General of Division. In the communes indigènes the municipal council is composed entirely of French officers and native chiefs, and no elections are allowed. The law of 1919 giving the municipal vote to certain qualified Moslems who are not French citizens (p. 8) does not apply to the Territoires du Sud. The real local unit is the tribe, with its caïd (p. 12) assisted by a djemaa (p. 11) of notables nominated by the Governor-General.

Only the civil budget of the Territoires du Sud has any autonomy. Military expenses (about two-thirds of the total) are covered by a subsidy from metropolitan France. The civil budget comprises receipts from taxes of all kinds, levied in the territories themselves except those relative to civil pensions. The receipts are in fact

chiefly fed by Arab taxes, which have been maintained in their traditional form (cf. pp. 288–289). Surplus receipts are placed in a reserve fund which can be used for public works in the territories. All civil expenses actually received on behalf of the territories figure in the civil budget, except those relative to civil pensions.

The civil budget is prepared by the Governor-General and submitted to the Conseil de Gouvernement: it is regulated by decree, subject to the approval of the Minister of the Interior. The creation, suppression, and modification of taxes is authorized by decree of the Conseil d'État in France.

Administrative Changes since 1940

Under the Vichy Government the prefects in the northern departments were given increased powers particularly in economic matters, and special economic services were created in the departments under them. They were also given greater control over the communes and native affairs. This measure, which was superficially one of decentralization, seems in reality to have been (like similar measures in France itself) one of greater centralization, the chief effect being to tighten the hold of the bureaucracy on the administration. It does not appear to have been modified since the Allied landings in 1942. As an integral part of France, Algeria was also scheduled by the Vichy Government to form a region in the new regional system established in metropolitan France, a project which may see further developments should regionalism continue to be encouraged in France after the war.¹ The Vichy Government also suspended all elected assemblies in the local as well as the central government of Algeria and replaced them by nominated bodies. On 14 March 1943, however, General Giraud declared that all elected assemblies in French North Africa would be restored: this pledge has now been fulfilled, although new elections have been postponed until after the war.

Since the Allied occupation a closer connexion has been established between northern and southern Algeria, following on a decree issued by the Governor-General on 8 February 1943, which placed the Territoires du Sud under the control of the Direction des Affaires Musulmanes. The object of the measure was, it was stated, the co-ordination of native policy, and also budgetary economies.

Various attempts have been made since the War of 1914–1918,

¹ A survey of regionalism in France both before and since September 1939 is given in the Geographical Handbook of France, Vol. II (B.R. 503 A).

and particularly since 1930, to co-ordinate administration and secure a certain unity of policy in the three territories of French North Africa. Periodical meetings between the Governor-General of Algeria and the Residents-General of Tunisia and Morocco have been held. The Governor-General of French West Africa and French Equatorial Africa have also attended these conferences in recent years. The attempts of the Vichy Government to bind the African territories of France more closely together are described in Vol. I, pp. 206-208.

LAW AND ORDER

Justice

It was decided that the law of France as it stood at the date of the conquest (22 July 1834) should be applied to Algeria, but with certain modifications. This means that the laws of France of general application at that date are in force, including the French Civil Code (*Code Napoléon* or *Code civil*), which codifies the common law. In practice the courts allow themselves considerable latitude in its application. There is also a body of native law, applicable to natives only, the importance of which has varied as French policy has favoured assimilation to France or aimed at the development of native institutions. The two systems of law are administered by French and native courts respectively. All the French courts have civil and criminal jurisdiction except the *cours d'assises*, which deal with serious offences (*crimes*), as distinct from delinquencies and petty offences.

The lowest court is the *justice de paix* presided over by the *juge de paix*. These are established in each of the chief towns of the 104 *cantons judiciaires* and in certain other towns as well. There are thirty-four of these cantons in the department of Algiers (arrondissements of Algiers 16, Médéa 3, Miliana 4, Orléansville 3, Tizi Ouzou 8), twenty-nine in the department of Oran (arrondissements of Oran 9, Mascara 3, Mostaganem 6, Sidi bel Abbès 4, Tiaret 2, Tlemcen 5), and forty-one in the department of Constantine (arrondissements of Constantine 13, Batna 5, Bône 6, Bougie 6, Guelma 2, Philippeville 4, Sétif 5). Two types of courts are distinguished: those with ordinary jurisdiction (*compétence ordinaire*), of which there are twenty—one in the chief town of each of the seventeen *arrondissements judiciaires* (p. 17), with additional courts in Algiers (2) and Oran (1); and those with extended jurisdiction (*compétence étendue*), as in the 'old colonies' of the French Empire like Réunion. There are ninety-eight

of these latter courts, which resemble the Courts of First Instance (described below), except that they have only one judge. In addition there are twelve military justices de paix in the Territoires du Sud (p. 19). Besides a law degree these magistrates must hold a diploma in Algerian legislation and Moslem law. The other legal functionaries—notaries, solicitors, ushers (*huissiers*), appraisers (*commissaires-priseurs*), and registrars (*greffiers*)—are the same as in France, with the addition of court interpreters.

An appeal lies to the Court of First Instance (*tribunal de première instance*), held in the chief town of each of the seventeen judicial arrondissements (*arrondissements judiciaires*). These arrondissements do not always correspond with the administrative arrondissements, listed on p. 11, Blida being the head of a judicial but not an administrative arrondissement, whereas Médéa and Miliana are the chief towns of administrative but not judicial arrondissements. The courts deal with both civil and petty criminal offences, and are presided over by a bench of judges.

All appeals dealing with civil cases and petty criminal cases go to the Court of Appeal (*cour d'appel*) at Algiers; this comprises eight main courts (*chambres*), five civil and three criminal, and in addition one Court of Committal (*chambre des mises en accusation*) and one Court of Review in Moslem Cases (*chambre de revision en matière musulmane*). The bench consists of a President of the Court of Appeal, eight court presidents, thirty judges (4 of whom are honorary), and the Court of Appeal has attached to it a Public Prosecutor (*procureur-général*) and eight assistant Public Prosecutors (*avocats-généraux*) with their deputies. Serious criminal cases are brought before the Courts of Assize (*cours d'assises*), which hold their sessions in turn at Algiers, Oran, Constantine, and Bône. They are composed of judges taken in turn from each of the courts (*chambres*) of the Court of Appeal, and are the only courts where a jury is used; natives are not allowed to act as jurymen.

A final civil and criminal appeal lies from the Court of Appeal and the Court of Assize respectively to the *cour de cassation*, which sits only in Paris.

Besides these four grades of courts there are two other types, with non-professional judges, dealing with special interests. One is the Commercial Court or *tribunal de commerce*, of which there are four, at Algiers, Oran, Constantine, and Bône. They are staffed by *juges consulaires* elected by business men, and decide commercial cases. The second special court is the Industrial Court or *conseil des*

prud'hommes, of which there are nine, at Algiers, Oran, Constantine, Bône, Bougie, Mostaganem, Philippeville, Sidi bel Abbès, and Tiaret; there was also one at Mascara from 1904 to 1922. They are presided over by members elected by employers and workers, and have jurisdiction in cases arising from contracts of service.

The criminal courts are organized as in France, where procedure goes back not only to Napoleon but, in the matter of the preliminary inquiry, to Louis XIV's Grand Ordinance of 1670. After the preliminary inquiry before the *juge d'instruction*, who is an examining magistrate not a judge, the case is brought before a chamber of accusation, if the inquiry has established a *prima-facie* case against the accused. Here a long act of accusation is prepared should the chamber be satisfied that there is ground, after which the case may go before the Court of Assize. For petty offences the *tribunal de simple police* deals with delinquencies (*contraventions*) and the *tribunal de police correctionnelle* with misdemeanours (*délits*).

Native Moslem law has lost a great deal of its importance. Criminal jurisdiction was taken away from Moslem and Jewish tribunals in 1842, and since then has remained entirely in the hands of French judges. From the conquest until 1888 the *cadi* or Moslem judge dealt with all civil and commercial disputes between Moslems, unless the parties agreed to go before a French court. Since then the jurisdiction of the *cadi* has been limited to matters of succession, marriage, paternity, and property not governed by French law. Moslem common law is administered by the *juge de paix*: in Kabylie there are no *cadis* and the *juge de paix* decides all cases between Moslems. An appeal lies from the *cadi* to the Court of First Instance.

Although some of the *cadis* had the reputation of being extortionate or open to bribes, they dispensed a simple, speedy, and inexpensive justice, which the natives could readily understand. French codified law is too complicated for the native, and tends to make him the prey of all the minor officialdom of the law.

In 1902 two special criminal courts were established with jurisdiction over natives—the *tribunal répressif* and the Criminal Court (*cour criminelle*). The *tribunal répressif*, established in each of the headquarters of the 104 cantons judiciaires, was composed of a *juge de paix* as president and two assessors, a Frenchman and a native, nominated by the Governor-General: the functions of *ministère public* or department of the Public Prosecutor were discharged by a local administrator or his deputy, but more often by an assistant *juge de paix*. These tribunals dealt with misdemeanours (*délits*)

committed by the natives other than those who were French citizens, and replaced the Courts of First Instance. In 1930 it was decided that such cases should go before a tribunal de police correctionnelle or the juge de paix with extended jurisdiction, according to the case: this came into force on 1 January 1931, when the tribunal répressif was abolished. The Criminal Court, which replaces the Court of Assize for crimes committed by natives, is held in each centre of a judicial arrondissement. There are seventeen of these courts. In Algiers the court is presided over by a judge of the Court of Appeal with two other judges, or, in default of these, two judges from the Court of First Instance. In the other arrondissements they are composed of a judge of the Court of Appeal or the President of the civil court of the arrondissement, two other judges of the same court, and two French and two native assessors.

Disciplinary powers to deal with special breaches of the law by natives were formerly held by the administrators, but were suppressed on 1 January 1928. They were a relic of the direct rule by the army over the local tribes, the powers being codified by Bugeaud, Governor-General of Algeria from 1840 to 1847, but when civilians replaced the army in the bureaux arabes they were no longer necessary. The Governor-General, however, had, and still retains, in his discretion, the power to impose collective punishment, confiscation, and internment in order to repress or punish rebellion. His powers were slightly modified in July 1914 when internment was replaced by special supervision limited to two years and surrounded by numerous guarantees.

In the Territoires du Sud military courts have been maintained. There are twelve justices de paix, at Ghârdaia, el Goléa, el Oued, In Salah (Tidikelt), Ouargla, Touggourt, Adrar (Touat), Ain Sefra, Colomb Béchar, Géryville, Mechéria, and Timimoun (Gourara). There are also *commissions disciplinaires* (described below) and *tribunaux militaires* which replaced the *conseils de guerre* abolished on 1 January 1929.

There is a *commission disciplinaire supérieure* at Algiers which has never yet met, and a *commission disciplinaire de subdivision* in each of the four territories of Ain Sefra, Ghârdaia, Touggourt, and the Oasis Sahariennes. They are composed of the commanding officer of the military subdivision as president, a member of the bar or a juge de paix, and two senior officers of the garrison. There is also a *commission disciplinaire de cercle* or *d'annexe* in each cercle or annexe, with its commanding officer as president, a juge de paix or his

deputy, and an officer of the garrison, where possible with the rank of captain. The penalties vary according to the authority inflicting them, and are within strict limits. The courts deal with acts of hostility, crimes, and misdemeanours (crimes and délits) committed by natives who are not naturalized French citizens, and which cannot be brought before the civil and military tribunals.

In the *tribunaux militaires* the penal code, not the code of military justice, is applied, as the natives brought before them are not part of the army. All serious crimes and misdemeanours (crimes and délits) are brought before this court, which acts as a Court of Assize and a tribunal correctionnel: the sentence of banishment may be pronounced. Its military character is marked by the fact that no civil case is tried, and that a native condemned to death is shot.

Armed Forces

In 1939 the army of Algeria and Tunisia was formed by the 19th Army Corps, which included three divisions. Frenchmen resident in Algeria had to perform the same military service as in metropolitan France, and all natives were liable to serve and could be called up as reservists in case of mobilization. In practice the number of men required (fixed each year by the Minister of War) was obtained by drawing lots. The usual duration of service was two years, though some categories of recruits were dismissed after a year's service and there were certain dispensations. French subjects (as opposed to citizens) served in special corps and could reach the rank of captain. Although the troops might be stationed in north Africa or employed on colonial expeditions, they formed part of the metropolitan, not the colonial army. The European troops were formed into six regiments of zouaves (each of 3 battalions of 5 companies), six cavalry regiments, the chasseurs d'Afrique (of several squadrons), and one regiment of Flying Corps: the artillerymen and engineers had their recruiting depots in France. The Foreign Legion, of four regiments, had a varying number of battalions, and was composed of foreigners of any nationality, although it was chiefly officered by Frenchmen. The headquarters were at Sidi bel Abbès, but the battalions might be sent to any colony as required. The natives formed twelve regiments of the Tirailleurs Algériens (each of 3 battalions) and six regiments of Spahis or Arab cavalry (each of several squadrons). The officers and a proportion of the non-commissioned officers of these native regiments were French. Since 1902 the Territoires du Sud have had four 'compagnies' of Saharan troops, each comprising infantry (goums),

cavalry, méharistes or Camel Corps, and artillery. The three air commands of French North Africa (Morocco, Algeria, and Tunisia) were under a combined higher command with headquarters at Algiers: it had fighter, bomber, reconnaissance, and transport groups, and was organized into five squadrons. In Algeria they were based on Maison Blanche (near Algiers), Blida, la Sénia (near Oran), and Sétif. The naval forces were commanded by a rear-admiral in Algiers, under a vice-admiral resident at Bizerta. Recruitment for the navy was the same as in France: in addition a special body of native sailors was created in 1903. The important naval stations were at Oran, Algiers, and Bône, where forces of destroyers, submarines, and minelayers were stationed: the new base at Mers el Kebir near Oran was begun in 1937, but was far from complete at the outbreak of war (pp. 123-124).

Police

As in metropolitan France, there are two main divisions of police, the administrative and the judicial. The purpose of the administrative police is to prevent breaches of the law and disturbances of public order; that of the judicial police is to inquire into crimes and collect evidence for the courts.

Control of the administrative police is vested in the Minister of the Interior, but more directly in the prefects of each department, and in the sub-prefects and mayors of each arrondissement and commune, working in conjunction with the police superintendents (*commissaires de police*) under the direction of the prefects; they deal with the general preservation of law and order. In the communes the mayor, through the superintendents and constables (*agents de police*), deals with matters of public security and the general life of the commune. The maintenance of public order is one of the main functions of the general administrative police, who serve also as a political and detective force. The *police mobile* attached to them are primarily concerned with criminal investigation, having thus the functions of judicial police.

The judicial police are closely connected with the administrative police. Many are officers of both, and the mayors and superintendents of the municipal administrative police can act as officers of the judicial police. There are, however, certain officers, such as the juge d'instruction (an examining magistrate, cf. p. 18) and the juge de paix, who are peculiar to the judicial police. Their functions are always exercised under the authority of the criminal Court of Appeal.

In addition to these two divisions there is also the *gendarmerie*, which forms part of the army under the Ministry of War, but also acts under the Ministries of the Interior and of Justice. There are two sections, the departmental *gendarmerie* and the *garde républicaine mobile*. The former has a company for each department, subdivided into sections and brigades. Its headquarters are at the general army headquarters of the district. It maintains the security of the countryside and the communes, renders assistance in times of danger, and discharges various duties connected with the recruitment and mobilization of the army. The *garde républicaine mobile* is stationed near large towns and is ready to help the departmental *gendarmerie*, and through them the civil authority, in any emergency.

EDUCATION

Before the French occupation there were two types of education in Algeria: elementary education, which comprised reading, writing, and the learning by heart of passages from the Koran, taught in the *talebs* or village schools; and secondary or higher education taught in the *medersas* attached to the mosques, where Moslem theology and law were the principal subjects.

French attempts to improve the education of the natives were at first marked by hesitation and periods of stagnation. The provision for the European and Jewish communities was inadequate, and it was only after 1880 that elementary education, in the European sense, was given in a few Franco-Arab schools, where the curriculum was copied from the schools of France. This proved totally unsuitable for the natives, and in 1883 the whole educational system was re-organized. Primary instruction was made compulsory for Europeans and Jews, whilst in the case of the natives discretion in the establishment of schools was vested in the Governor-General. Attempts at assimilating the Moslem population by means of mixed French and Arab primary and secondary schools had little success owing to racial prejudice and the general indifference of most of the natives to education. Since about 1920 there has been some improvement, although the number of schools available for the native population is still inadequate.

European Education

The education of Europeans comes directly under the French Minister of Public Instruction and is organized as in France. There

are four main types, represented by the nursery, elementary, and secondary schools and by the University of Algiers.

The *écoles maternelles* or nursery schools receive children from the age of two to six years. In 1938 there were 120 of these schools, with 21,249 children (11,317 boys and 9,932 girls).

Elementary education is given in the *écoles primaires*, which take children from six to fourteen years, and teach reading, writing, arithmetic, history, geography, science, singing, and drawing, as in France. In 1938 there were 1,224 of these schools, with 159,725 children (84,749 boys, 74,976 girls): these figures included natives, who are able to attend French schools. From thirteen to sixteen years of age children are taught to the standard known as *primaire supérieure*: the curriculum is partly general and partly specialized, according to local conditions of agriculture, industry, and commerce. The examinations taken are the *Brevet élémentaire*, the *Brevet supérieur*, and the competitive entrance to the *écoles normales primaires* (the training colleges for elementary school teachers, described on p. 24). In 1938 there were thirty *écoles primaires supérieures*, eighteen for boys, with 5,695 pupils, and twelve for girls, with 3,691 pupils. They are usually, though not always, in the chief towns of the *arrondissements*.

Secondary education for boys is given in the *lycées*, of which there are three in Algiers and one each in Oran and Constantine, and in the *collèges coloniaux* at Blida, Bône, Bougie, Médéa, Mostaganem, Philippeville, Sétif, and Sidi bel Abbès. In 1938 there were 9,914 pupils (8,952 French, 923 natives, and 39 foreigners). There were six schools for girls, two at Algiers and one each at Oran, Constantine, Bône, and Philippeville, with 4,392 pupils (4,277 French, 68 natives, and 47 foreigners). Many of the better schools for girls are kept by religious orders: there are seven of these in Algiers, five in Oran, and two in Constantine. The pupils of the secondary schools are up to eighteen years of age, and the curriculum includes French, classical and modern languages, history, science, and philosophy. The school-leaving examination, the *baccalauréat*, is taken in two parts, and is the entrance examination for the university and the professions.

Higher education is given in the University of Algiers, which is open to both Europeans and natives. There are four faculties—law, medicine and pharmacy, science, and arts—to which are attached a number of important departments. Associated with the science faculty are the Observatory at Bouzarea, the Algerian Meteorological

Service, and the Agricultural and Industrial Institutes at Maison Carrée. The Pasteur Institute, which is run in conjunction with the same institution in Paris, and the Institute of Hygiene and Colonial Medicine of French North Africa are attached to the medical faculty, and the Institute of Practical Law to the law faculty. There are laboratories for chemistry, physical geography, geology, mineralogy, physics, parasitology, and physiology. In 1938 there were 2,248 students, including 100 natives (law 966, medicine and pharmacy 583, science 241, and arts 458).

Native Education

As indicated above, there have been continual changes of policy with regard to native education. In 1892 it was decided that the State should contribute half, and the communes half, towards the cost of erection and maintenance of schools, but the very poor response to this measure caused it to be abandoned. After 1922 it was realized that interference by the communes delayed educational schemes, and it was decided that they should be obliged to contribute only towards the upkeep of the schools. Elementary education was simplified and adapted for the natives with the study of the French language as its basis. After 1925 a certain amount of initiative was shown by the natives to start their own schools; their curriculum approached that of the Europeans more closely and girls' schools ceased to be for crafts only, both French and mathematics being taught as well. In 1938 there were 689 *écoles communales* and *écoles indigènes*, of which ten only are private, attended by 76,859 Moslem children in the proportion of about eight boys to one girl. There are no *écoles primaires supérieures* for natives only, but scholarships are offered to the French schools in Algeria. The medersas of Algiers, Constantine, and Tlemcen have a partly Arab and partly French curriculum analogous to the secondary education of the French schools. They had 163 students in 1938 (149 Arabs and 14 Kabyles). More and more natives are going to the French secondary schools instead of the medersas, although the latter used to supply a considerable proportion of native officials.

Professional and Technical Education

The *écoles normales primaires*, or training colleges for elementary school teachers, are similar to those in France. In 1938 there were three for men with 45 lecturers and 368 students, and three for women

with 26 lecturers and 116 students. There is a three years' course, and the examination at the end, the *Brevet supérieur*, is taken after a year's practice in teaching.

Technical instruction is given in many of the primary schools for girls, and in some of the boys' schools the pupils are apprenticed to certain crafts. In agricultural districts they are given practical instruction in agriculture. There are also apprentice workshops for girls, which permit them at the end of the course to live at home and gain a living from their craft. The workshops of the Sœurs Blanches specialize in the teaching of basket-work and carpet-making. Certain establishments under the direction of the Governor-General teach masonry, carpentry, pottery, carpet-making, and other similar trades. For natives above school age there are technical centres, divided into agricultural and industrial sections, at Philippeville, Guelma, and elsewhere.

PUBLIC HEALTH

In the nineteenth century there was little medical assistance organized by the French, and only one Moslem benevolent society founded in Algiers in 1857. At the beginning of the twentieth century the situation was taken in hand, and in 1903 the first infirmaries were built from small sums of money added to the taxes paid by the natives, and later by similar sums raised by the communes; but the money available for health schemes in Algeria has always been small, especially in comparison with certain French colonies. The programme for 1930-1935 provided for an expenditure of five million francs in the departments of Algiers and Oran, and two million francs in the department of Constantine, to set up auxiliary hospitals for the natives. In 1939 the number of hospitals of all kinds (civil, military, and auxiliary) was 174 (department of Algiers 59, department of Oran 38, department of Constantine 54, and the Territoires du Sud 23). Homes for the aged, infirm, and incurables are attached to the civil hospitals. There are eleven in the department of Algiers, six in the department of Oran, and seven in the department of Constantine. Special hospitals for natives (auxiliary hospitals) were at first established only by the Pères Blancs; their number has greatly increased in recent years, rising to ninety in 1939, each with from twenty to thirty beds, and they have now been taken over by the State.

Medical assistance outside the hospitals is given in a variety of

ways. Consulting rooms, known as *salles de consultations rurales*, have been set up near markets and road centres and in certain outlying districts, and are visited and supervised by state doctors (*médecins de colonisation*). The first-aid posts (*postes sanitaires avancés*) are staffed by medical assistants (*auxiliaires médecins*) and not only render first-aid but fight epidemics and give education in hygiene. Eye hospitals and anti-trachoma posts, in addition to the specialized wards in the civil hospitals at Algiers, Oran, and Constantine, have been established for the treatment of simple cases of trachoma in centres especially affected, such as Bou Saada, el Kantara, l'Hillil, and Perrégaux. Treatment is given by medical assistants under the supervision of state doctors. There are anti-trachoma consulting rooms at Biskra, Bône, Mascara, Mostaganem, Orléansville, Perrégaux, Philippeville, Relizane, Saida, Sétif, St. Cyprien des Attafs, St. Denis du Sig, and Sidi bel Abbès. There are also 118 centres for the treatment of venereal diseases.

In 1937 there were over 900 doctors (*docteurs en médecine*)—412 in the department of Algiers, 258 in the department of Oran, 217 in the department of Constantine, and 33 in the Territoires du Sud. State doctors (*médecins de colonisation*) were created in 1903 to give free medical aid and to supervise social hygiene: there were ninety-eight in 1930. The country is now divided into 112 areas (*circonscriptions*), each visited by a state doctor; thirty-three of these districts are in the department of Algiers, thirty-three in Oran, and forty-six in Constantine. More than 100 medical assistants (*auxiliaires médecins*) help and supplement the state doctors; they are usually natives who have had a three years' course of training after leaving school. There are also eighty state nurses (*infirmières visiteuses*), many of whom are midwives with two years' training at the Hôpital Parnet in Algiers. They nurse in the auxiliary hospitals, accompany the state doctors, and make monthly tours to outlying districts.

The native provident, benefit, and mutual aid societies formed for agricultural purposes (pp. 195–196) also provide medical assistance. Altogether there are about 200 of these societies with 524,000 members.

LAND TENURE

In the early years of the French occupation of Algeria the state of land property was very confused, largely as a result of the administrative disorder consequent upon the fall of Algiers. The position was further complicated by the fact that the systems of land tenure

represented a combination of Moslem law and native tradition, overlain by Turkish influence. Broadly speaking, three main types of tenure were recognized—*beylik*, *arch*, and *melk*.

The *beylik* or *makhzen* lands constituted the domain and were the property of the State. They were acquired in a variety of ways, usually by conquest or by confiscation from unsatisfactory owners. The present state domains cover nearly 20,000 square miles (5,114,000 hectares).

The *arch* lands belonged to tribes or groups in communal tenure, the title being held according to Koranic law. These lands were most common in the east of the country (the modern department of Constantine), but also occurred in the west, where they were known as *sabega*. They were inalienable, and the members of the tribe using them paid a special tax (*hokkor* in the east and *gherrama* in the west) as a form of rent. Since the French occupation the payment of these taxes has lapsed. In certain cases where land was not in productive occupancy it has been made available for colonization, but nearly 10,700 square miles (2,767,000 hectares) remain as arch lands.

Melk or *mulk* included all forms of freehold in land, and also of trees growing on it: the latter might be owned independently of the soil on which they were growing. This form of tenure was particularly common in the towns and in mountainous districts, notably the Kabylie, the Aurès, the Ouarsenis, and the Dahra. The land belonged to individuals or families, not to whole tribes, and passed from father to son or sons. Joint occupancy by as many members of the family as the land could maintain was, however, fairly common in many districts, except in the Kabylie, where the subdivision of land was pushed to such extremes that different branches of the same tree sometimes belonged to different persons. Titles were generally very confused, since there were no written records, and often there were two or more claimants to the same plot of land. This usually arose because individual owners belonging to tribes forcibly expropriated had retained the titles originally granted to them, whilst other titles had been issued to members of different tribes settled in their place. Some of these features of melk land remain at the present day. Altogether there are 17,942 square miles (4,647,000 hectares) of melk land.

Land also belonged to the *habus*, or Moslem endowments. This institution, which is known as *wakf* in the Middle East, consists of real property held in trust for religious and charitable purposes.

These trusts are sometimes very complicated, and may retain the use of the lands to the founder and his heirs for several generations. Formerly *habus* land was inalienable, but an ordinance of 1844 and a law of 1851 made possible the sale of land if desired by a European colonist, whilst a further decree in 1858 legalized such sale where the purchaser was a native. Thus *habus* in Algeria now controls only the succession of the land, in contrast to most Moslem countries, where these endowments are still inalienable.

The history of colonization since the French occupation has been briefly described in Vol. I, pp. 198–200. At first colonists were unable to obtain land by lawful transfer because the boundaries of property were so ill defined and difficult to determine, and the only lands available for them were confiscated *beylik* lands. Private ownership had to be substituted for the traditional system, though the limits of the tribal properties already existing had first to be defined. A *sénatus-consulte* of 22 April 1863 declared the tribes as owners of the land they had been using, and provided for their delimitation and division between the various newly formed groups (the *douars* and the *communes*). It also recognized private ownership by the issue of title deeds for such individual or family property (*melk*) as already existed. In 1873 the immediate conversion of tribal and family property into private freehold was legalized. This law was subsequently amended in 1887, and defective administration made further laws necessary in 1897 and 1926. Relatively few natives have so far taken advantage of their opportunities under these laws.

In the early days of colonization government lands were given free to all applicants, though usually with only a provisional and insecure tenure. Not until 1860 was a satisfactory position achieved, when the precedent of Australia was followed and a form of the well-known 'Torrens' system of land registration instituted. Under this system there is an official investigation of title, with the publication of a warning that the property is in question. Any claims resulting are promptly investigated, and then the property is surveyed and its limits marked. Copies of the final record and plan go to the purchaser, whose title is thereafter, so far as he is concerned, unassailable: if any subsequent claims prove just, the State bears the cost of compensation. This process—known as *immatriculation*—prevents recurrent legal conveyancing and facilitates future transfers on sale, and gives the owner complete confidence in his title. The public sale of the domain lands at a fixed price had the effect in Algeria of attracting a better type of colonist, so that by 1870 the state domains

had been exhausted. They were replenished, however, by the large-scale confiscations following the widespread revolts of 1871. In 1881 the law of 1860 was repealed despite the good results which it had achieved.

In 1904 a new scheme was introduced in order to attract further European settlement. All the state lands (except woods and forests) were made available for colonization, and four modes of transfer were recognized—sale at a fixed price at a public office (the usual method), sale by auction under public control, sale by private treaty, and free concession. Purchasers of land had to be French citizens, either by origin or naturalization, and were obliged, under pain of forfeiture, either to take up residence on their property within six months and to live on it and exploit it for a period of ten years, or to place on the land another family which would fulfil the same conditions. If the purchaser farmed the land himself and proved a satisfactory colonist, the period of obligatory residence was reduced to five years. In the case of a free grant of land the grantee himself had to be the farmer. Land acquired under this scheme could not, under any circumstances, be let to natives for at least ten years.

Land was also put at the disposal of societies or individuals in order to establish agricultural settlements, peopled by colonists fulfilling the same conditions as independent settlers. Two-thirds of the population were to be immigrants from France, and the remainder Frenchmen or naturalized Frenchmen already resident in the country, though the Governor-General could permit the introduction of non-French immigrants for the purpose of establishing special industries. Within two years of the establishment of a village, land had to be transferred gratuitously by the society or individual to the settlers, under pain of forfeiture to the State.

A decree of 9 September 1924 lengthened the period of obligatory residence from ten to twenty years, and increased the period during which the land might not be transferred to persons other than French citizens to forty years. The proportion of colonization land reserved to natives was increased from one-third to one-half. Of the total area of colonization land rather more than one-quarter belongs to private individuals, the rest being occupied by official colonization. Official schemes have almost come to an end, and in the future are not likely to do more than develop communications and establish new settlements in the areas thus opened up. Altogether there are about 600 European agricultural centres (Photos. 35, 36), 230,000 farmers, and 90,000 proprietors. The development of agricultural colonization

is described on pp. 198–201. The ownership of land at the present time is as follows:

Public and private state domains	.	19,745	square miles (5,114,000 hectares)
Communal lands	.	16,035	„ „ (4,153,000 „)
European private property (including official colonization schemes)	.	9,266	„ „ (2,400,000 „)
Affranchised private property of natives	.	7,000	„ „ (1,813,000 „)
Melk lands	.	17,942	„ „ (4,647,000 „)
Arch lands	.	10,684	„ „ (2,767,000 „)

Note. The following account of a new status granted to Moslems in Algeria was published in *The Times* of 11 March 1944:

‘The French Committee of National Liberation has adopted an ordinance revising the status of Algerian Moslems. The new ordinance enunciates the principle that French Moslems of Algeria will enjoy the same rights and be submitted to the same duties as the non-Moslem French, and will have access to all civil and military posts.

‘Laws will be applied without distinction to both categories, with the exception of the Moslem law and Berber customs of personal status and property in the case of those Moslems who have not expressly declared their desire to be subject to French civil law. All disabilities affecting the Moslems are abrogated.

‘Citizenship, with the right to vote, is to be given to all male Moslems over 21 who have been officers or passed any one of certain examinations. They will vote under the same register as Europeans.

‘The conditions governing the right of remaining Moslems to vote will be fixed in the constituent assembly, but from now on all male Moslems over 21 without distinction will be electors and eligible in Algerian assemblies of all kinds. They will also come within the scope of universal military conscription.

‘The ordinance gives effect to the intentions expressed by General de Gaulle in his speech at Constantine on December 11’ [1943].

CHAPTER X

POPULATION

AT the beginning of the French occupation of Algeria in 1830 the total population probably numbered about 2 millions and was almost exclusively native. In 1856 the population amounted to 2,487,373 (including 159,282 Europeans)¹ and had increased by 1861 to 2,962,384:¹ much of this increase was probably more apparent than real and due mainly to the greater accuracy of the census. Between 1861 and 1872 the population declined to 2,404,743 (2,416,225 including military forces). There were several reasons for this decline—the cholera outbreak of 1867, which caused at least 67,000 deaths; the famine of 1868, as a result of which 300,000 and possibly 500,000 people died; and the rebellion of 1871, mainly amongst the Kabylie tribes. Since 1872, however, there has been a constant increase in the numbers of the total population, and of both the native and European sections of it. The increase in each five-year period has generally been between 300,000 and 400,000, except during the War of 1914–1918, when it was rather less than usual. The rate of increase more than recovered, however, in the following years: 487,071 between 1926 and 1931, and 681,233 between 1931 and 1936. At the last census (8 March 1936) the total population was 7,234,684—6,247,432 natives and 987,252 Europeans—and it was estimated to have increased to 7,490,000 by the outbreak of war in 1939. No more recent figures are available, though there was a great influx of refugees from both occupied and unoccupied France after June 1940, estimated at between 100,000 and 150,000. The growth of the population from 1856 to 1936 is shown diagrammatically in Fig. 4.

The density of population for the whole of Algeria (including the Territoires du Sud, which are very sparsely peopled) is about 8·4 to the square mile, but the figure for the three northern departments of Oran, Algiers, and Constantine is much higher—about 81·4 to the square mile. This latter figure is half that of the population density of Bulgaria, where about 7 million people live in an area about half the size of northern Algeria. Eire, with an average of 112 persons

¹ These figures refer to the *municipal* population only (i.e. excluding military personnel, &c.).

to the square mile, has half as many persons again to the square mile as the three departments of Algeria.

Census returns are available for every five years since the French conquest of the country, except for the years 1871 and 1881 (when the census was taken in 1872 and 1882) and for the year 1941. Up

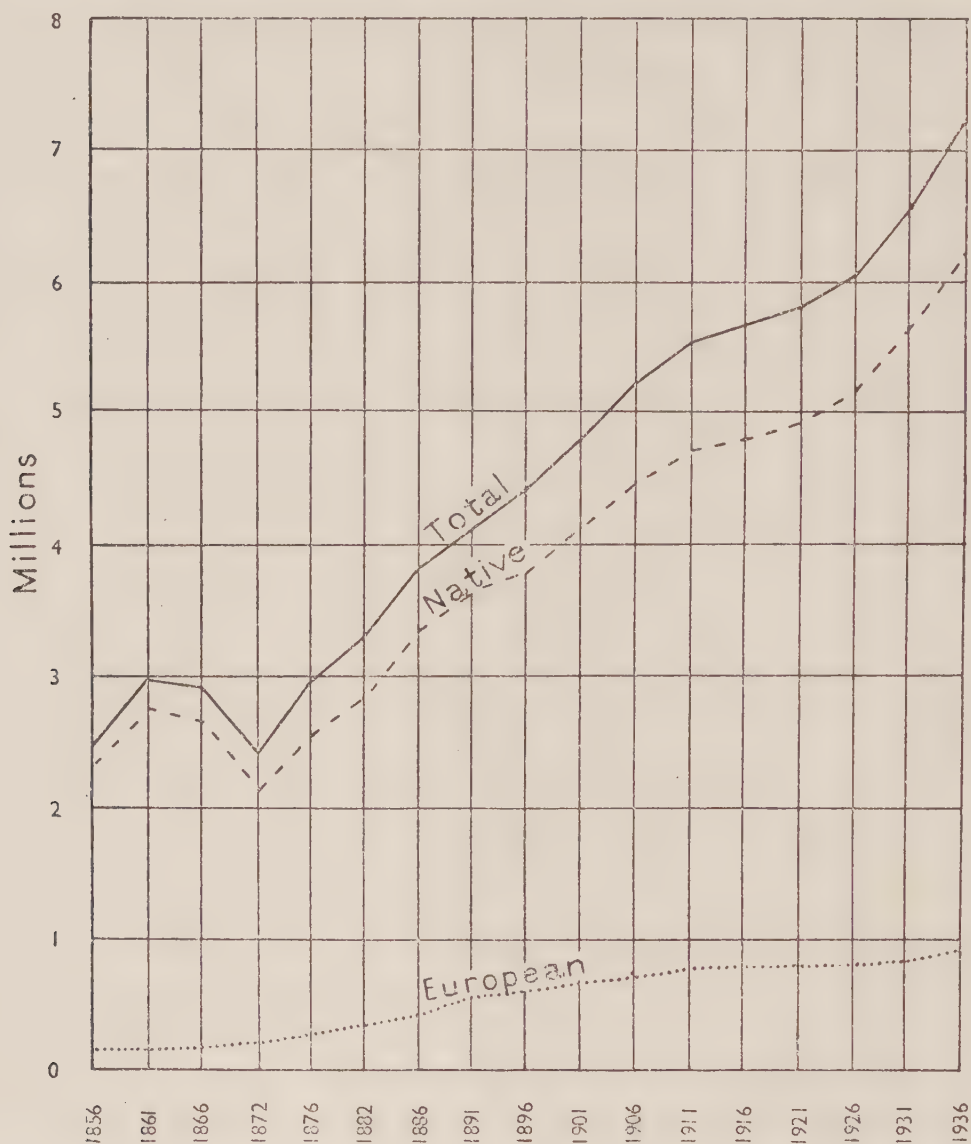


FIG. 4. *The increase of population, 1856-1936*

to 1856 the only natives included were those living in the towns: since that date all natives have been counted, at first very roughly, but with increasing reliability at each census. Even the European figures are not completely accurate, nor are they strictly comparable, since they do not always refer to the same areas. The boundaries of the departments and arrondissements, for example, have been changed from time to time, and the vast, but only scantily peopled, area of the Sahara was included for the first time in 1901.

DISTRIBUTION OF POPULATION

The great contrast between the density of population of northern and southern Algeria is shown by the figures of the 1936 census.

<i>Department or Territory</i>	<i>Population</i>			<i>Density per square mile</i>		
	<i>Total</i>	<i>Native</i>	<i>European</i>	<i>Total</i>	<i>Native</i>	<i>European</i>
NORTHERN ALGERIA						
Oran . . .	1,623,356	1,223,682	399,674	62.4	46.9	15.4 ¹
Algiers . . .	2,240,911	1,875,407	365,504	106.1	88.8	17.3 ¹
Constantine . . .	2,727,766	2,514,647	213,119	80.6	74.3	6.3 ¹
Total . . .	6,592,033	5,613,736	978,297	81.4	69.4	12.1
TERRITOIRES DU SUD						
Ain Sefra . . .	193,347	187,954	5,393	0.78	0.75	0.021
Ghardaia . . .	166,366	164,232	2,134	3.10	2.96	0.036
Touggourt . . .	243,363	242,498	865	4.66	4.66	0.018
Oasis Sahariennes . . .	39,575	39,012	563	0.096	0.096	0.0013
Total . . .	642,651	633,696	8,955	0.83	0.82	0.013
ALGERIA (NORTH AND SOUTH)						
GRAND TOTAL . . .	7,234,684	6,247,432	987,252	8.49	7.35	1.14

¹ The figures in this column are more accurate than those given in Vol. I, p. 227, where the density of population was stated to be 13 to the square mile in Oran, 13 in Algiers, and 5 in Constantine.

The general decrease of population from north to south is illustrated in Fig. 5, a copy of Vol. I, Fig. 51, which is repeated here for convenience. In general the most densely populated districts coincide with the areas of heavy rainfall, such as the Grande Kabylie and the Kabylie des Babors (cf. Vol. I, Fig. 41), and with the parts of the country which are most easy of access, such as the Mitidja behind Algiers, and the lowlands surrounding Philippeville and Bône. The width of this belt of population is much greater in the east than in the west, where there is less rainfall and the coastal plains are less suited to the settlement of either Europeans or natives. The mountainous areas of Algeria, which are generally unsuitable for Europeans, have often attracted the natives from the surrounding plains, because they afforded security, fertile soils, heavy rainfall, and generally healthy conditions. Besides the Kabylie mountains already mentioned, the Aurès, the Ouarsenis, and the Massif des Traras all have surprisingly dense populations.

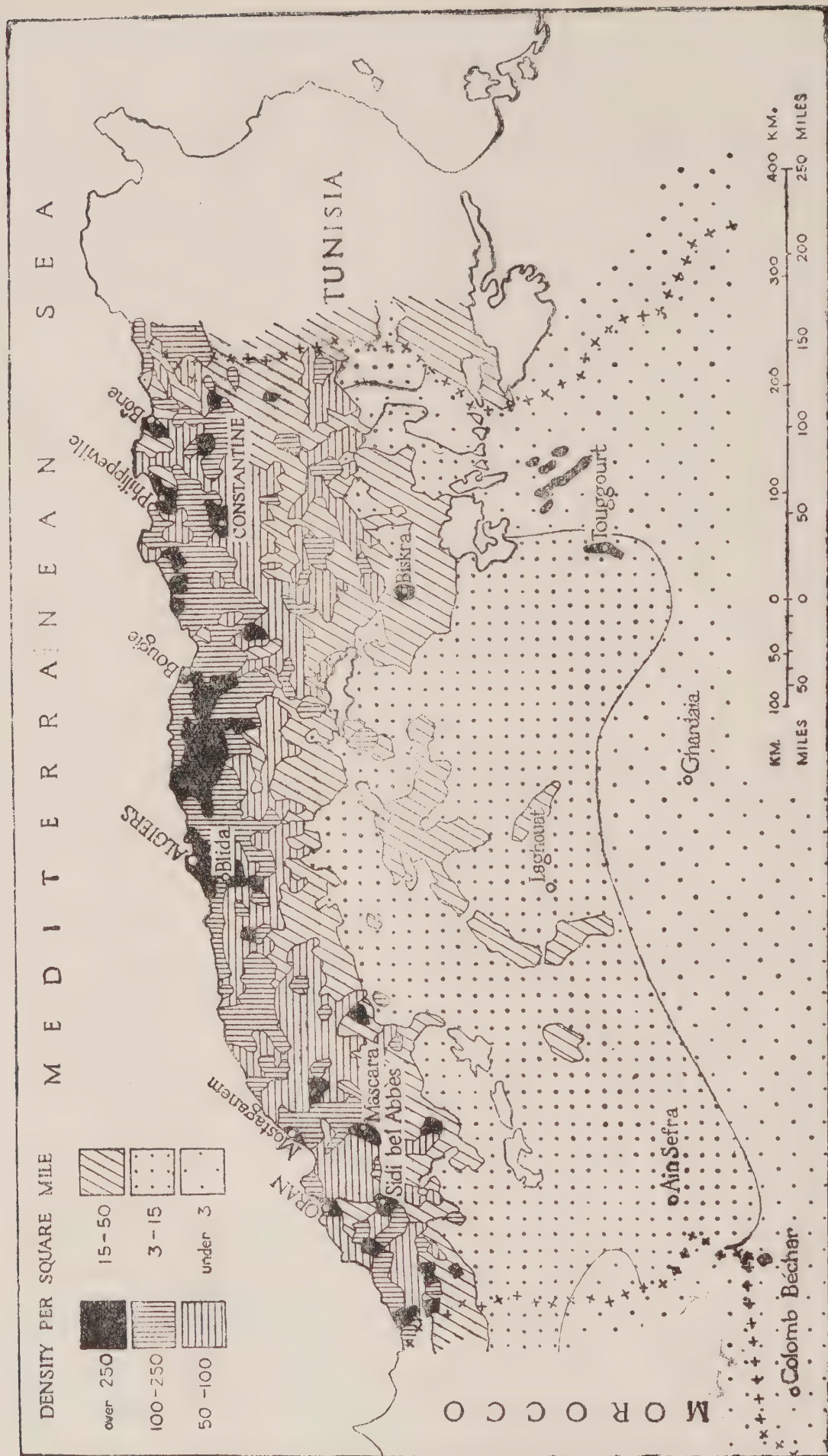


FIG. 5. The density of population, 1936

To the south of the coastlands and the mountains of the Tell the population decreases rapidly. The High Plateaux, coinciding more or less with those areas with 12 or less inches of rainfall per annum, seldom have more than about 15 persons to the square mile, because here sheep-rearing and the gathering of alfa are almost the only means of livelihood, and each flock must have a large area for pasture. Farther south, where the rainfall is even less, the population becomes almost negligible, apart from the two lines of densely populated oases along the northern edge of the Sahara. The first line runs from Colomb Béchar and Figuig in the west through el Abiod Sidi Cheik (at the foot of the Monts des Ksour) and Laghouat to Tolga and Biskra, and coincides closely with the 8-inch isohyet. The second extends from the cities of the Mزاب (Metlili, Ghardaia, Berriane, and Guerrara) to Touggourt and the Souf oases and follows the 4-inch isohyet. Still farther south lie oases such as those of Ouargla, el Goléa, and Timimoun, surrounded by vast stretches of uninhabited desert.

In the northern part of the country there are considerable variations in density, some areas having more than 250 persons to the square mile and others less than 15. The arrondissement of Tizi Ouzou in the Grande Kabylie had 375 persons to the square mile in 1936, and the communes mixtes of Fort National and Djurdjura (both in the Grande Kabylie) had 600 and 635. These figures are comparable with those of such crowded industrial countries as Belgium and explain, in part at least, the emigration of many of the Kabylie people to France, described on pp. 45-46 (cf. Fig. 12). In contrast some areas are only sparsely populated, usually because of lack of rainfall. The small population of the valley of the Oued Chélif is especially noticeable, though here the danger of flooding and the incidence of malaria are both contributory factors (Fig. 13). The influence of climatic and other factors upon settlement, particularly of Europeans, is more fully discussed on pp. 51-52.

The figures given on p. 33 reveal some striking differences between the three departments of northern Algeria. The department of Constantine has the greatest population, largely because of the comparatively wide extent of the Tell, which reaches as far south as Biskra. Its density per square mile, however, is considerably less than the figure for the department of Algiers, whilst the European population is the smallest in northern Algeria. There are, therefore, as many as twelve natives for every European. The department of Oran, on the other hand, has only three natives for every European:

it has in fact more Europeans than either of the other departments, but its native population and also its total population are the smallest. The department of Algiers is midway between its neighbours from the standpoint of the total, the native, and the European population, and of the ratio of natives to Europeans (five to one), but on the whole it forms the most densely peopled area in the country.

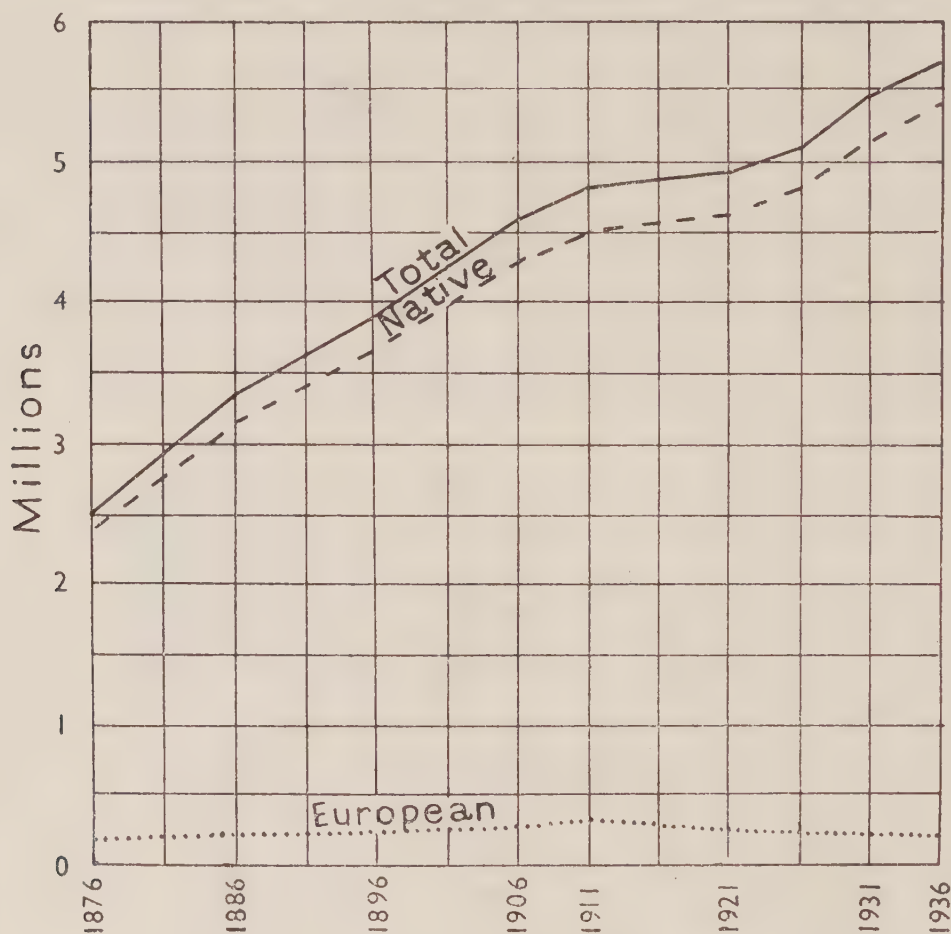


FIG. 6. *Rural population*

The large European population is not, however, as widely scattered as in the department of Oran, nearly two-thirds of the total living in the city and immediate surroundings of Algiers.

The figures for the four territories of southern Algeria need little elaboration. The bulk of the population live in the three northern territories, and the density increases in general from west to east. The people of the desert are concentrated in the small districts where water is available and cultivation possible. Here the density per square mile is often very great, and much overcrowding occurs in towns such as Ghardaia and el Oued.

Urban Population

The steady growth of both the urban and the rural population in Algeria since 1876 is illustrated in Figs. 6 and 7. The distinction between the two types of population is one of fundamental importance, but the published statistics do not give a very satisfactory picture of the position. 'Municipal population', as used by French statisticians in Algeria, includes all persons except those counted separately: this latter class consists mainly of military personnel (European and native) and persons in hospitals and boarding schools. The line of division between 'urban' and 'rural' is generally taken, in Algeria as in metropolitan France, as 2,000: communes with 2,000 or more

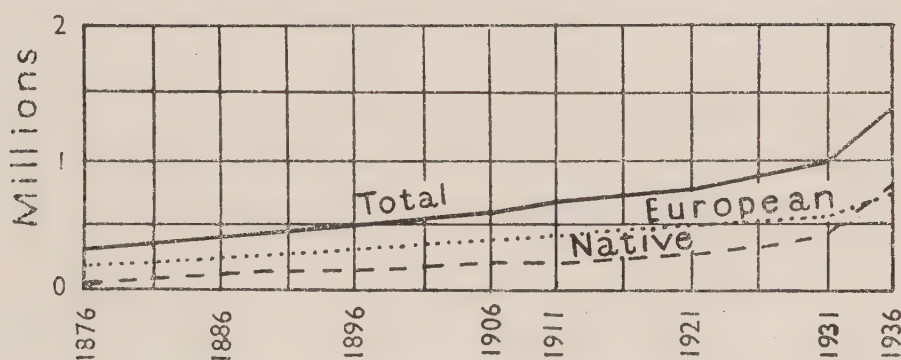


FIG. 7. Urban population

inhabitants are classed as urban, those with less as rural. Such a distinction is, however, purely arbitrary. Some mining communities, which are 'urban', have populations of less than 2,000; on the other hand, many communes with considerably more than 2,000 inhabitants are purely rural. There are communes with as many as 2,000 or more European inhabitants which are, in fact, purely agricultural settlements, such as Boufarik, Guyotville, Marengo, Rouiba, and St. Denis du Sig.

Not only is 2,000 an unsatisfactory figure, but serious difficulties arise whatever figure is chosen, if the distinction between 'close' (*population agglomérée*) and 'scattered' (*population éparsé*) is ignored. The commune of Tizi Ouzou, for example, was credited with 40,526 inhabitants in 1936, but only 3,267 lived in what may be termed the 'built-up' or 'urban' area of the town of Tizi Ouzou. Similarly the commune of Bordj Menaiel (between Ménerville and Tizi Ouzou) had a population of 26,908, of which only 2,946 was urban and the rest rural.

In practice no basic figure can be taken for calculating the urban population of the country, and in the census of 1936 the population

of the following communes de plein exercice was classed as 'urban' and the rest of the population as 'rural':

Department of Algiers: Algiers (together with its suburbs of Birmandreis, Bouzarea, el Biar, Hussein Dey, Kouba, Maison Carrée, and St. Eugène), Blida, Boufarik, Médéa, Miliana, Orléansville, Tizi Ouzou, Cherchel, and Ténès;

Department of Oran: Oran (with Arcole, Mers el Kebir, and la Sénia), Ain Témouchent, Mascara, Saida, Sidi bel Abbès, Tiaret, Arzeu, Mostaganem, Relizane, Perrégaux, Beni Saf, Nemours, and Tlemcen;

Department of Constantine: Constantine, Batna, Biskra, Bône, Philippeville, Guelma, Sétif, Souk Ahras, Tébessa, Djidjelli, and la Calle.

These communes had a total population of 1,431,513, about 19 per cent. of the country's total population, or 22 per cent., if the Territoires du Sud be excluded. The proportion of Europeans living in the towns is much greater than that of the natives: nearly half of the urban population, in fact, is European, and about 70 per cent. of all the Europeans in Algeria live in towns. The city of Algiers alone with the suburbs mentioned above contained nearly a quarter of the total European population in 1936.

Altogether there are between fifty and sixty towns in Algeria with a population of more than 5,000: the approximate positions of most of these is shown in Fig. 14. Those with 10,000 or more inhabitants are listed in the table opposite, which gives the figures of the total, the native, and the European population according to the census of 1936. The figures refer to the total (not the municipal) population of the commune named. Since these figures are often much larger than the number living in the built-up or urban area (the *population agglomérée aux chefs-lieux des communes*), the latter figure is given in the last column. Because of the differences in these figures the position of Ménerville in the table is particularly misleading: the population of other urban areas is also much smaller than that of the communes which bear their names, notably in the case of Orléansville, Médéa, Bordj bou Arréridj, and Miliana. There are also two communes in the Territoires du Sud with more than 10,000 inhabitants in the urban area—Ghardaia with 14,144 persons (13,887 natives and 257 Europeans), the chief town of a commune indigène of 47,154 people, and el Oued (11,936—11,704 natives and 232 Europeans), the centre of a commune mixte with a population of 77,908.

The Population of the Chief Towns of Algeria, 1936

<i>Town (Commune)</i>	<i>Native</i>	<i>European</i>	<i>Total</i>	<i>Total in built-up (urban) area</i>
Algiers . . .	81,729	182,503	264,232 ¹	221,551
Oran . . .	48,068	152,603	200,671 ²	189,420
Constantine . . .	59,368	54,409	113,777	80,873
Bône . . .	40,250	46,082	86,332	67,702
Philippeville . . .	32,276	33,836	66,112	37,640
Sidi bel Abbès . . .	20,944	33,810	54,754	49,306
Tlemcen . . .	40,881	13,382	54,263	23,651
Blida . . .	30,113	13,930	44,043	25,871
Mostaganem . . .	20,405	18,150	38,555	35,973
Sétif . . .	26,013	10,028	36,041	28,350
Mascara . . .	18,404	15,118	33,522	29,100
Bougie . . .	25,510	6,109	31,619	23,035
Tiaret . . .	12,411	11,211	23,622	21,904
Orléansville . . .	18,248	4,327	22,575	5,222
Biskra . . .	19,127	2,196	21,323	20,123
Perrégaux . . .	12,228	8,383	20,611	8,699
Ain Témouchent . . .	10,192	8,329	18,521	15,187
Médéa . . .	15,676	2,717	18,393	5,442
Relizane . . .	11,938	4,558	16,496	14,610
Souk Ahras . . .	10,555	5,509	16,064	13,372
Guelma . . .	12,485	3,475	15,960	8,893
Ain Beida . . .	14,239	1,514	15,753	10,230
Boufarik . . .	10,259	5,334	15,593	9,300
Batna . . .	11,769	3,735	15,504	10,166
Bordj bou Arréridj . . .	12,845	1,928	14,773	4,936
Saida . . .	8,260	6,501	14,761	11,377
Beni Saf . . .	9,499	4,248	13,747	7,413
Miliana . . .	10,315	3,206	13,521	4,843
Djидjelli . . .	11,338	2,134	13,472	10,099
Ménerville . . .	10,115	2,640	12,755	2,656
Cherchel . . .	10,504	2,156	12,660	5,799
Tébessa . . .	10,064	2,380	12,444	7,770
Marengo . . .	8,065	3,147	11,212	5,899
Rio Salado . . .	5,188	5,782	10,970	6,634
St. Denis du Sig . . .	6,837	3,841	10,678	6,045
Hammam bou Hadjar . . .	7,439	3,078	10,517	5,263

¹ 367,093 with the suburbs named on p. 38 (240,533 Europeans).

² 210,821 with the suburbs named on p. 38 (159,789 Europeans).

The three towns with more than 100,000 inhabitants are the capitals of the departments of the same name—Algiers, Oran, and Constantine. Algiers and Oran are also the first and second ports of the country. Constantine is about 40 miles from the nearest point on the coast and is served by two ports, Bône and Philippeville, which are the fourth and fifth towns of Algeria. Sidi bel Abbès and Tlemcen, both inland centres of western Algeria between Oran and

the Moroccan frontier, are the only other towns with more than 50,000 inhabitants. There are ten towns with populations of between 20,000 and 50,000, and twenty with from 10,000 to 20,000.

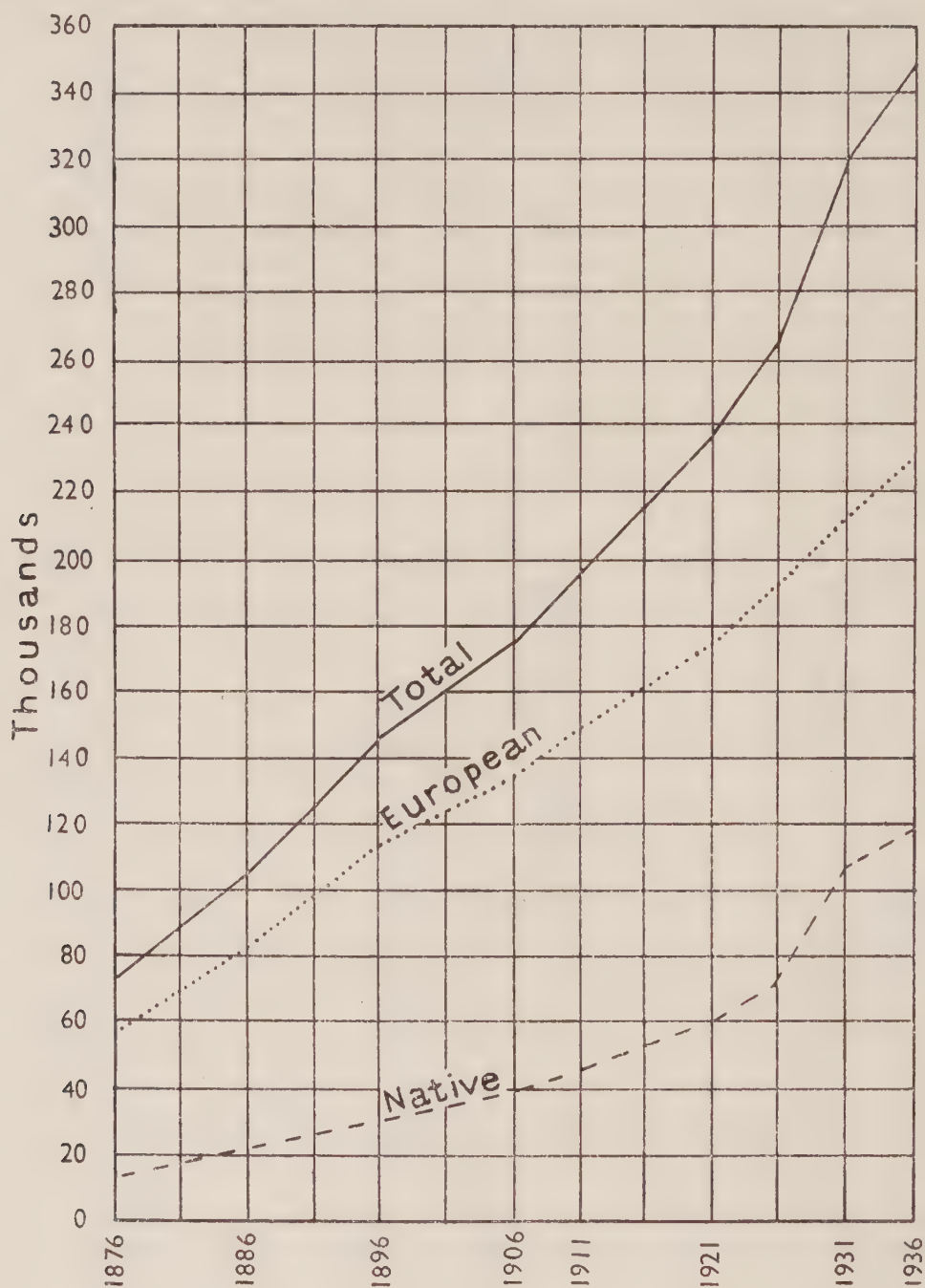


FIG. 8. *The growth of the population of Algiers, 1876-1936*

The increase in the number of people living in the towns is shown by the fact that whereas 19 per cent. of the population was classed as urban in 1936, only 11 per cent. was urban in 1876. In the latter year Algiers alone had a population of more than 50,000 (72,939, including 58,172 Europeans), and only Oran (48,159), Constantine

(34,726), Bône (23,186), and Tlemcen (21,942) had more than 20,000 inhabitants. Thus in sixty years Algiers has increased fourfold, and now ranks as the fourth town of France after Paris, Marseilles, and Lyons. It is the largest city in French North Africa, although it is now closely rivalled by Casablanca, which had a population of 257,430 in 1936. Oran and Constantine—the tenth and twenty-third towns respectively in France—are both three times as large

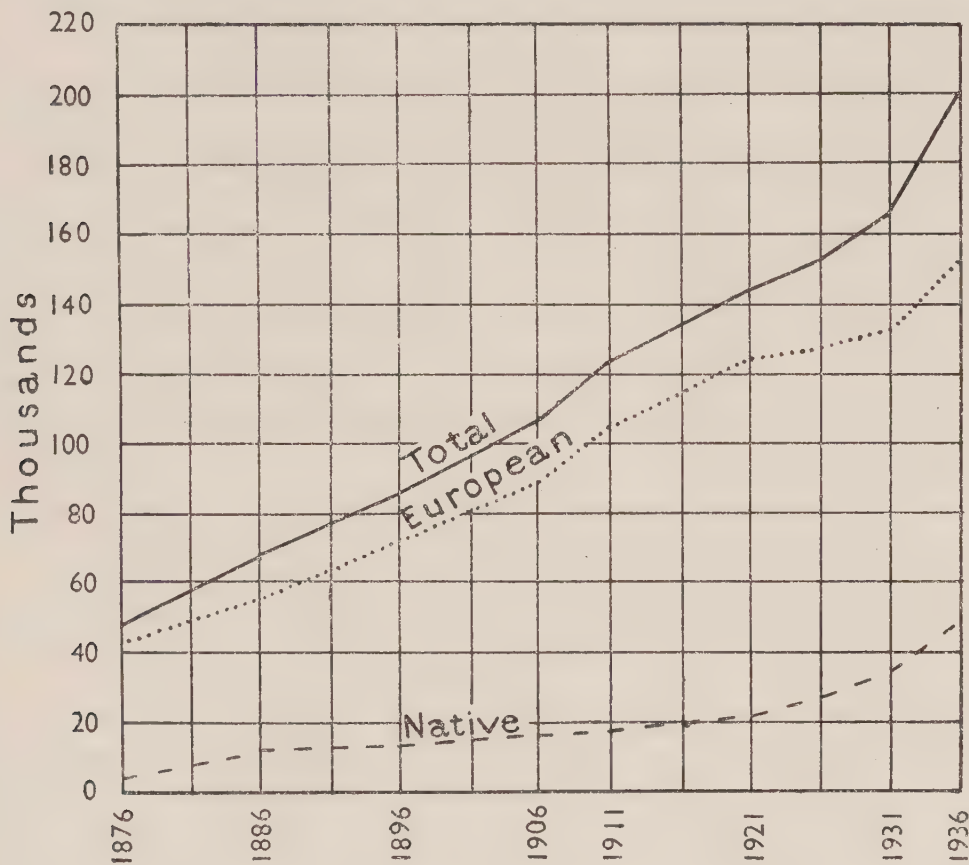


FIG. 9. *The growth of the population of Oran, 1876–1936*

as they were in 1876, and Bône is nearly four times as large. The growth of these four towns between 1876 and 1936 is illustrated in Figs. 8–11. The tendency of recent years for the rural population, both native and European, to migrate to the towns, especially to the larger centres, is increasingly marked throughout the country. As a consequence many of the villages and smaller towns are being depopulated, and serious problems of housing and overcrowding are developing in the towns. Some of these problems have already been tackled by the administration: overcrowded native quarters, for example, are being demolished, and the people rehoused in new districts, and food and other relief schemes have been made available for the destitute. But many other serious problems remain, and the

great influx of refugees from metropolitan France during the war has only intensified them, since the majority of these immigrants have settled in the towns, particularly in the larger and already densely populated towns along the coast.

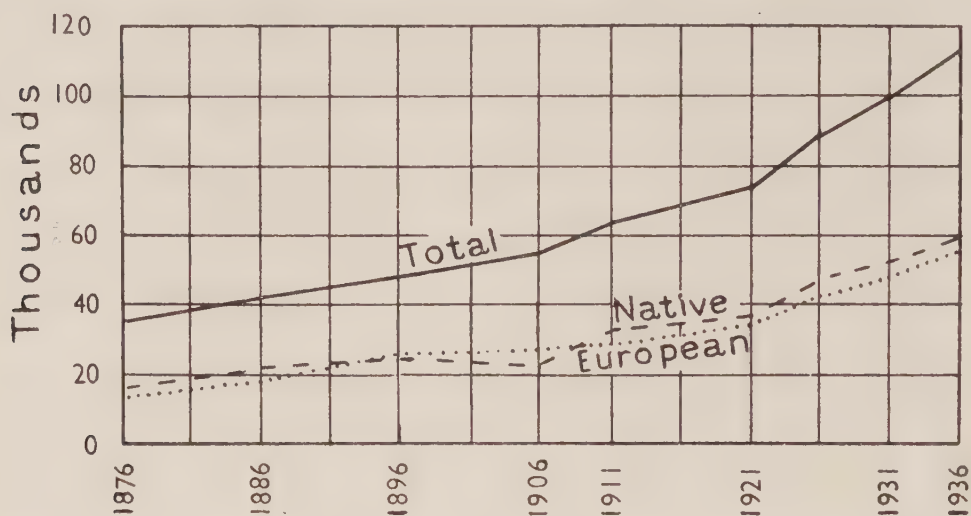


FIG. 10. *The growth of the population of Constantine, 1876-1936*

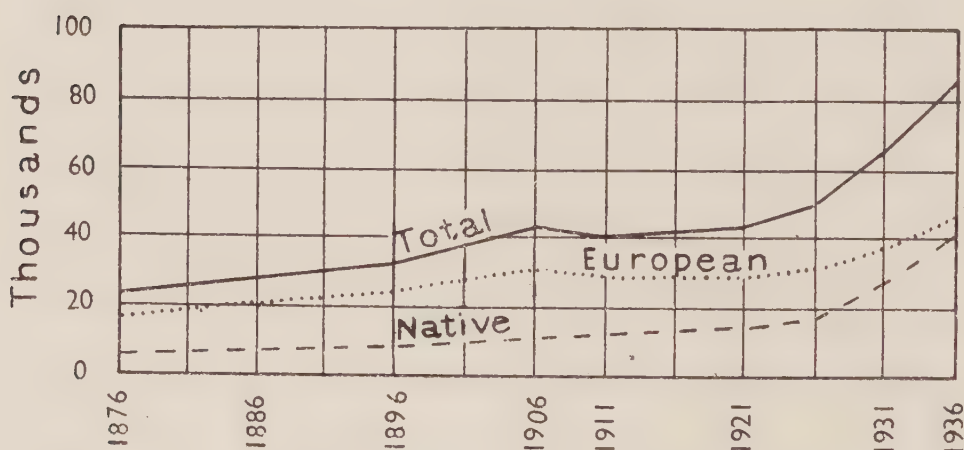


FIG. 11. *The growth of the population of Bône, 1876-1936*

GROWTH OF POPULATION

Vital Statistics

Reliable statistics are available only for the European population, which accounts for less than 14 per cent. of the total. Registration was made compulsory in 1882 for natives as well as Europeans, and vital statistics have been published since 1901. In northern Algeria registration of male births is believed to be reasonably complete, at least in many of the towns, but numerous female births are not registered, the sex ratio being about 120 male for 100 female registered

births. Deaths of infants are known to be inadequately recorded throughout the country. The gaps in the registration of older children and of adults are said to be greater for females than for males. In the Territoires du Sud the figures for both births and deaths are so low that the records are obviously deficient and apt to be misleading.

Since 1856 the European birth-rate has always exceeded the death-rate, though both rates have fallen considerably during the present century. The birth-rate was 34 per 1,000 in the period 1881-1885, and only 22.5 in 1926-1930, though it remains higher than the notoriously low birth-rate of metropolitan France (18.2 in 1926-1930). The death-rate has fallen from 29.5 in 1886-1890 to 14.7 in 1926-1930: the latter figure is about the same as that of France and considerably below that of Spain (22) or Italy (20). The annual excess of births over deaths has averaged between 7,000 and 8,000 since 1905, except during the War of 1914-1918.

Figures for the period 1933-1937 are given below:

	<i>Number of births</i>			<i>Total number of deaths</i>	<i>Still births</i>
	<i>Of French parents</i>	<i>Of foreign parents</i>	<i>Nationality of parents unknown</i>		
1933 . . .	18,339	1,780	1,308	12,698	648
1934 . . .	17,386	1,482	1,416	12,931	685
1935 . . .	15,897	2,896	1,292	12,598	702
1936 . . .	15,493	2,350	1,085	11,523	620
1937 . . .	14,462	2,158	914	12,013	589

The Jews in Algeria have high birth- and death-rates (37 to 49 and 25 to 30 per 1,000 respectively), giving them an average increase of 18 per 1,000, a rate of increase unsurpassed anywhere in Europe. This largely accounts for the almost fivefold increase in the number of Jews since 1851.

As mentioned above, there is little systematic recording of births and deaths amongst the native population except in the large towns. In 1936, 225,871 births, 1,403 still births, and 97,511 deaths were recorded, but these must represent only a small proportion of the total. Information about birth- and death-rates is available only for the combined native and European population of the city of Algiers. The figures refer to the years 1936, 1937, and 1938, and corresponding figures for Casablanca and Tunis are given for purposes of comparison.

	<i>Municipal population</i>	<i>Birth-rates per 1,000</i>			<i>Death-rates per 1,000</i>			<i>Deaths of infants under one year per 1,000 live births</i>		
		1936	1937	1938	1936	1937	1938	1936	1937	1938
Algiers .	252,000	28.1	28.2	28.1	15.6	17.3	17.8	132	139	151
Casablanca	258,000	..	..	..	16.1	22.5	31.7	..	..	..
Tunis .	220,000	38.9	37.2	37.8	25.2	25.7	25.5	149	159	149

If the figure for the birth-rate for Algiers be taken as typical of the country as a whole—it is probably considerably lower than the average—Algeria has a birth-rate exceeding that of any country in Europe except Roumania. The figure for Algiers is, however, considerably below that of Tunis and of other north African cities such as Alexandria and Cairo (both 42.2 per 1,000 in 1938). The infant mortality rates are very high—more than double those of most cities in western Europe—but in most years they are lower than the figures for Tunis.

The death-rate is lower in Algiers than in any other north African city, probably because of the high proportion of Europeans (175,694 in the municipal population) in the city. The most common diseases and causes of death are mentioned in Vol. I, pp. 164–166. Algiers escaped the worst effects of the drought, famine, and plague of 1937, which led to the great increase in the number of deaths in Casablanca during 1937 and 1938.

Information regarding marriage is only scanty. In 1936 there were 6,691 marriages between Europeans and 671 divorces, and in 1937, 6,724 marriages and 638 divorces. Native marriages recorded in 1936 numbered 22,949 and divorces 6,599, but figures for 1937 are not available.

Increase of Population

The European and native sections of the population must again be considered separately. The European population has increased steadily since about the middle of the last century, with an annual excess of births over deaths of between 7,000 and 8,000 during the past three or four decades. Between 1931 and 1936 there was an increase of 66,464. The native population has increased much more rapidly, though only since 1872. The inter-censal increases were particularly great between 1926 and 1931 (484,591) and 1931 and 1936 (614,769). The increase in the total, native, and European populations since 1856 is shown diagrammatically in Fig. 4. More

detailed information regarding the various elements of the population is given below (pp. 47-57).

Immigration

Immigration, which in the early days of the French colonization of the country was the essential means by which the European population increased (p. 50), has been relatively unimportant for a number of years, particularly since the War of 1914-1918. The number of Europeans born in Algeria is constantly increasing, and that of Europeans born elsewhere, mainly in metropolitan France, has correspondingly declined (cf. figures for 1931 and 1936 on p. 50). The immigration of non-Europeans is negligible apart from the small and unimportant movement of semi-nomadic tribes across the Moroccan, Tunisian, and French West African boundaries of Algeria, and the seasonal influx of labourers from eastern Morocco to help with the harvest in the department of Oran. In some years as many as 30,000 of the Beni Snassene tribe of the Berkane region of eastern Morocco have migrated to western Algeria. These movements are, however, discouraged by the Moroccan Government, and have sometimes been prohibited because of the shortage of labour in French Morocco itself. In 1928, for example, only men from the Oudjda district were allowed to migrate to Algeria.

Emigration

In the past there has been considerable emigration from Algeria to metropolitan France. Although the general figure for the density of population is not particularly high, there are, as shown above, certain areas, particularly in the mountains of the Grande Kabylie and the Kabylie des Babors, which may be regarded as over-populated, and from which people have moved elsewhere as temporary, though in some cases permanent, emigrants. Up to 1907 the Kabylie peoples went to other parts of Algeria, but since then emigrants have gone to France. This movement across the Mediterranean was further stimulated by the War of 1914-1918, for which Algeria provided 173,000 men for the services and about 120,000 workers for munition and other factories in France. To-day natives of Algeria are to be found in almost every department of France, and especially in the larger towns and industrial centres. In 1926 there were about 70,000 in France, nearly one-third of them being in the Paris region. The peak of the movement was in 1928, after which the figure fell

to 44,000 in 1931 (14,000 in or near Paris), partly as a result of legislation in Algeria restricting emigration, but mainly because of the lack of employment in France.

The districts in Algeria from which the emigrants came, according to the statistics of 1928, are shown in Fig. 12. The Grande Kabylie has always been the principal source, though many emigrants have also come from the Kabylie des Babors (especially the eastern part)

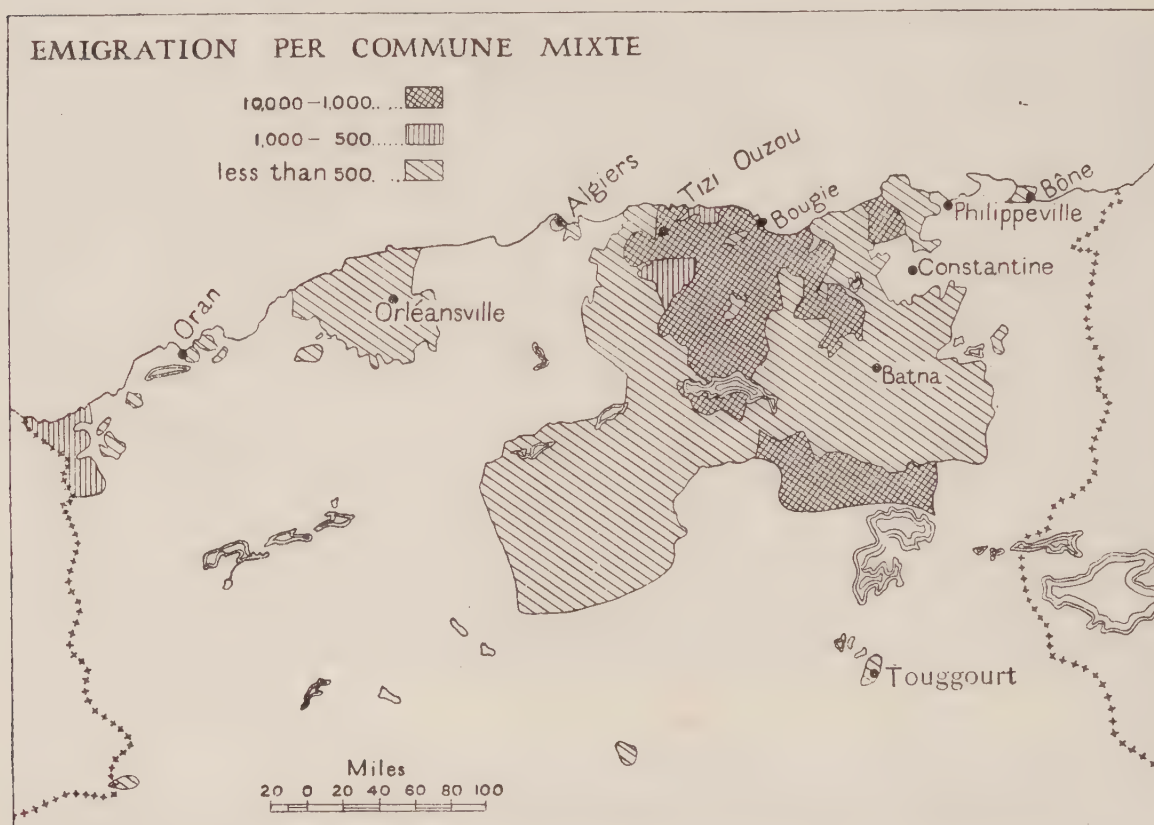


FIG. 12. *The areas from which natives of Algeria emigrated to France, 1928*

and from the districts adjoining the Moroccan frontier. In 1923 it was estimated that 8 per cent. of the population of Fort National and 7 per cent. of Michelet had gone abroad, with 5 per cent. of the population of Beni Mansour and other towns in the Grande Kabylie.

Algerian natives have also gone in small numbers to other parts of the world, notably to Cairo and Alexandria in Egypt. Some years ago there were a number in Syria, to which many of the followers of Abd el Kader (Vol. I, p. 195) went, but nearly all of them eventually returned. The migrations of the nomadic tribes of the Aurès mountains and the districts along the northern edge of the Sahara, described in Vol. I, p. 218, do not involve the crossing of either international or intercolonial boundaries, and are not, therefore,

considered in this chapter. Reference is made on p. 53 to the movement of Europeans from Algeria to French Morocco and Tunisia.

ELEMENTS OF THE POPULATION

The two great elements of the population—the native and the European—have been described briefly in Vol. I, pp. 211–216, but are here discussed in more detail.

Natives

The description of the growth of the population of Algeria given on p. 31 refers in the main to the native population, which in the early days of the French occupation accounted for nearly all the population and still forms over 86 per cent. of the total. The main feature has been the steady increase since the decline in numbers which took place between the census of 1861 and that of 1872 as a result of cholera, famine, and rebellion (Fig. 4). The native population in 1936 (6,247,432) was three times that of 1872 (2,125,052), and almost treble the figure of the 1856 census (2,328,091). Even allowing for the probable inaccuracy in the earlier returns (mainly in the direction of under-estimate), there has been a very remarkable increase of at least $3\frac{1}{2}$, and quite possibly nearly 4 millions during eighty years—an increase which ranks amongst the most rapid in the world. Vital statistics show that the proportion of natives to Europeans will increase in the future. Generally speaking, European settlement has been least important where the native population is most numerous and, as indicated on pp. 35–36, there are twelve natives to every European in the department of Constantine, compared with five and three to each European in the departments of Algiers and Oran respectively. In recent years the increase of the native population has been particularly marked in the coastal plains and in the Tell, and much slower in the region of the High Plateaux and the Saharan Atlas and in the Sahara.

The composition of the native population according to the census returns of 1931 and 1936 is given below. The figures exclude the small number of naturalized native Moslems (pp. 48–49).

Almost all the native population is Moslem, apart from about 100,000 Jews, who are not included in the above figures because they are French citizens. The number of native Christians is not available, but it is known to be very small despite the activities of various European missionary societies which have been established in French North Africa for many years.

The Native Population of Algeria, 1931 and 1936

	1931	1936
French subjects . . .	5,548,236	6,160,930
including Arabs . . .	..	4,970,638
including Kabylies . . .	..	1,141,201
including Mozabites . . .	..	30,725
including others . . .	..	18,366
Moslem foreigners . . .	40,078	40,214
including Moroccan origin . . .	33,840	36,825
including Tunisian origin . . .	2,918	2,542
including other origins . . .	3,320	847
Total native population . . .	<u>5,588,314</u>	<u>6,201,144</u>

The characteristics of the various elements of the native population, both Arab and Berber, have been described in Vol. I, Chap. VIII, to which reference should be made. To some extent the figures given in the above table are misleading because the figure of those classed as 'Arabs' undoubtedly includes many Berbers who have been arabized to a greater or less degree. There are no marked differences between the Moslem foreigners and the natives of Algeria. Those of Moroccan origin nearly all live on the borders of western Algeria, and those of Tunisian origin are mainly in the east. The political boundaries of Algeria are for the most part artificial and in many cases cut through tribal areas. In the west, for example, the Oued Moulouya forms the 'natural' dividing line between Morocco and Algeria, but the political boundary lies many miles to the east, so that the Beni Snassene peoples of the Oudjda, Berkane, Taourirt, and Berguent districts of eastern Morocco are separated politically from their fellow tribesmen of the western parts of the department of Oran. Many of the Moslem foreigners counted in the census of 1936 would be temporary immigrants—nomadic herdsmen of the plateaux of eastern Morocco, farm-labourers who had found employment in the department of Oran, and manual labourers in the ports and mining districts along the Tunisian frontier.

The figures given above exclude two important, though numerically comparatively small, sections of the native population—the naturalized native Moslems and the Jews. Both of these groups of people are French citizens and are classed with the European population in the census returns.

Naturalized Native Moslems. Since 1865 Moslems have been able to acquire French citizenship if they are willing to abandon their 'personal statute', that is, their Islamic laws and customs (cf. p. 12;

Vol. I, pp. 5-7, 216). Relatively few have availed themselves of this privilege, though their number increased from 5,836 in 1931 to 7,817 in 1936. Of this latter figure 3,951 were Arabs, 3,715 were Kabyles, and 151 Mozabites.

Jews. Jews have lived in Algeria for many centuries and may, for most purposes, be included with the native peoples. The French class them as Europeans for statistical purposes because all Algerian Jews were naturalized by the decree of 24 October 1870 (the Loi Crémieux), and rank as French citizens. This decree was abrogated by the Vichy Government in October 1940 and various measures were taken against the Jews, but since the Allied occupation citizenship and other rights have been restored to the Jews.

Reference has been made above (p. 43) to the high rate of increase amongst the Jews, whose numbers rose from 21,000 in 1851 to 42,000 in 1886 and 74,000 in 1921. Since 1921 they have not been recorded separately from French-born citizens, but it is estimated that there are now between 90,000 and 100,000 altogether. Nearly half of them live in the department of Oran, the town of Oran having over 16,000 in 1931 and Tlemcen 4,700. A quarter of them are in the department of Algiers (especially in the city of Algiers, which had nearly 18,000), and a quarter in the department of Constantine (mainly in Constantine itself with 12,000). There are also 1,510 in the Territoires du Sud: most of them live in Ghardaia and the other cities of the Mزاب.

There are separate Jewish quarters or *mellahs* in all the towns mentioned above as well as in Mascara, Blida, Bou Saada, and elsewhere. Many of the Jews are wealthy, Oran, for example, having many Jewish doctors and lawyers. There are, however, large numbers of Jews who are very poor, and housing conditions in some of the mellahs are appalling. In recent years many Jews have found employment in industry, in which they prove more reliable and adaptable than the Berbers. Generally speaking, a fair amount of toleration is shown to the Jews, and the anti-Jewish measures taken by the Vichy Government between 1940 and 1942 do not appear to have evoked much approval on the part of the native inhabitants of the country.

Europeans

The statistics for the European population, though much fuller and more reliable than those available for the native population, are not altogether satisfactory, since sometimes Jews and naturalized

Frenchmen have been counted separately, and sometimes included with French-born and Algerian-born citizens. They also include, as already explained, a small number of naturalized natives.

In 1936 there were 946,013 Europeans in Algeria (including the Territoires du Sud), compared with 881,584 in 1931. The detailed information of the European population in 1931 and 1936 is given below. Too much attention should not be given to the changes between the two census years, particularly those relating to the number of naturalized citizens and of foreigners, for the reasons explained on pp. 53-54.

	1931	1936
French citizens . . .	657,376	731,494
Metropolitan French origin . . .	133,128	116,099
Colonial origin . . .	524,248 ¹	615,395 ²
Naturalized French citizens . . .	75,866	87,956
Spanish origin . . .	27,938	36,314
Italian origin . . .	27,472	29,166
Maltese origin . . .	10,692	12,574
Other origins . . .	3,928	2,085
Naturalized native Moslems . . .	5,836	7,817
Total French citizens . . .	733,242 ³	819,450 ³
Total non-Moslem foreigners . . .	148,342	126,563
Spanish . . .	109,821	92,290
Italians . . .	26,136	21,009
Maltese . . .	3,706	2,982
Others . . .	8,679	10,282
Total European population . . .	881,584 ³	946,013 ³

¹ Including 98,646 of Jewish origin.

² Including 11,444 of colonial (other than Algerian) origin.

³ Including naturalized native Moslems.

To-day there can be no doubt that Europeans, particularly those from the south of Europe, are fully acclimatized in Algeria, but this was far from clear in the early years of European colonization. Between 1830 and 1856, for example, deaths (87,000) exceeded births (75,000), and immigration alone accounted for the increase in the European population from 600 to nearly 160,000. The colonists were ignorant of the elementary rules of health and conduct which had to be followed in a country such as Algeria, and the then un-drained marshes of areas like the Mitidja proved especially disastrous to settlement. Some colonies, such as Boufarik, were wiped out several times and had to be re-established with fresh immigrants. Malaria was perhaps the greatest scourge in those days, for little was known about it and no effective precautions could be taken

against it. Cholera was also a constant danger; in 1849 a particularly serious epidemic swept the country. Up to 1856 the only colonies that were always growing were, in General Duvivier's words, the cemeteries. Since 1856, however, the birth-rate has always exceeded the death-rate (p. 44), and the increase has been steady and constant (Fig. 4).

The areas where Europeans live are usually isolated from one another by districts inhabited mainly by natives, and only rarely do

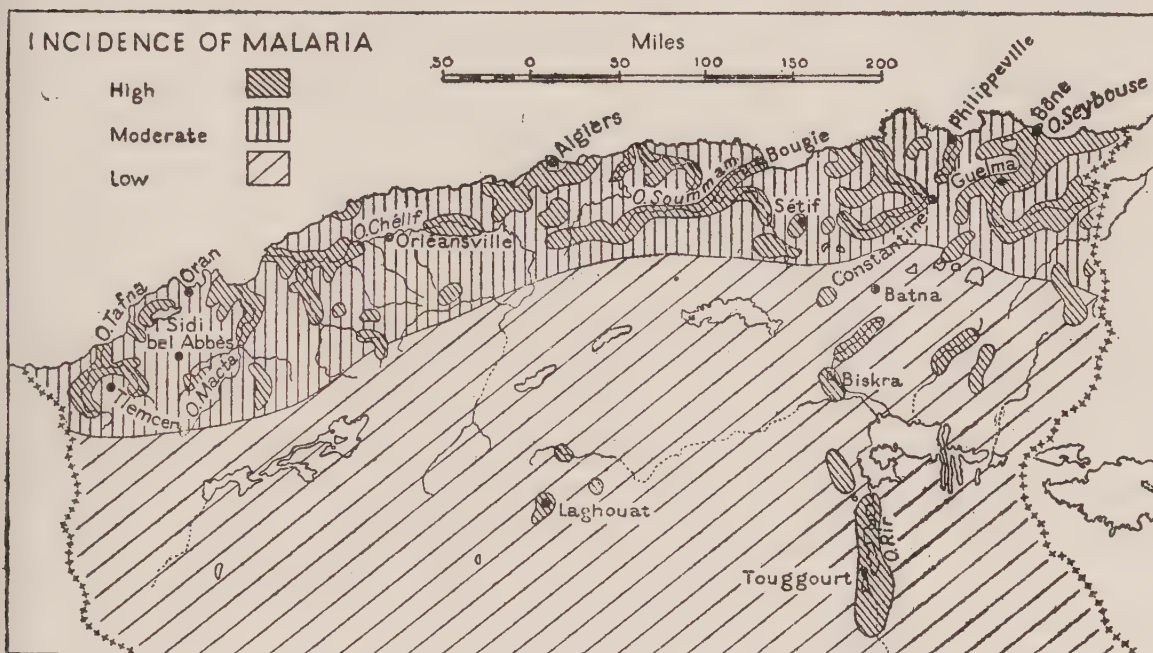


FIG. 13. *The incidence of malaria*

they form a continuous zone. A very large proportion of the Europeans is concentrated in and around the larger towns, especially the ports of Algiers, Oran, Bône, and Philippeville and the inland centre of Constantine, and nearly all of them live in northern Algeria, where they average 10 to the square mile. In 1936 there were 939,531 Europeans in the three northern departments, and only 6,482 in the Territoires du Sud. Most of them are in the coastal districts, where water is relatively abundant and cultivation often possible without irrigation. The availability or otherwise of water has in fact always been a major consideration with colonists in Algeria. Areas with inadequate or irregular rainfall, like the Chélif valley or the Batna region, have been avoided: so have the rivers, which are nowhere navigable, and are liable to flood. Malaria is also particularly common in the neighbourhood of river valleys, as shown in Fig. 13, which shows the principal malarial areas in the country (cf. Vol. I, pp.

167-169). It must be remembered, however, that drainage and land reclamation have substantially reduced the incidence of malaria in a number of the districts shown in this map.

Generally speaking, Europeans first colonized the coastal plains and then the interior plains. Mountainous areas have had few colonists, and these only in recent years, and the high plains and plateaux are still peopled almost exclusively by nomadic tribes. The small European communities in the mountains are usually engaged in mining and are, therefore, only temporary. But the supreme factor influencing the distribution of the European population in Algeria has been accessibility, and nearly all the European settlements are in close proximity to either main roads or railways.

Colonization has also been affected by the distribution of the native population, as mentioned above (p. 47), and the department of Oran has most European and fewest natives, whereas the department of Constantine, with about two-fifths of the total native population, has only one-fifth of the Europeans in the country. The dominance of the native over the European population is particularly marked in the Grande Kabylie and the Kabylie des Babors, where European colonies have made little progress and have even retreated in recent years in the face of the expanding native population. This has been especially marked in the Tizi Ouzou and Djidjelli districts and along the valley of the Oued Sahel.

In 1936, as shown in the table on p. 39, there were six towns with more than 30,000 Europeans—Algiers, Oran, Constantine, Bône, Philippeville, and Sidi bel Abbès. Another eight had 8,000 or more Europeans—Mostaganem, Mascara, Blida, Tlemcen, Tiaret, Sétif, Perrégaux, and Ain Témouchent. Altogether there were about fifty places with 2,000 or more Europeans, and these accounted for more than 75 per cent. of the total European population. Only about 60 per cent. of these Europeans, however, were 'urban' in the generally accepted sense of the term, since many of them, at least in the smaller centres, depended upon agriculture for their livelihood. As mentioned above (p. 37), Boufarik, St. Denis du Sig, and many other towns with at least 2,000 European inhabitants, are in reality purely agricultural settlements.

The European rural population has in general declined during the present century. The towns have attracted many of the original colonists, especially as improved communications have made it possible for people to live in the towns and yet supervise farms some miles away. The concentration of property in a few hands has also led to

a decline in the rural population: as a result some colonies have been almost entirely abandoned. In western Algeria large numbers of colonists have moved to the newly established settlement schemes of eastern Morocco, which owe their development so far almost entirely to the immigration of Europeans from Algeria.

French. About three-quarters of the Europeans in the country are French citizens by birth, and the foregoing paragraphs refer particularly to them. The number of those born in Algeria itself has been increasing steadily for many years. In 1876 only 64,512 had been born in Algeria, compared with 130,260 in metropolitan France, but since 1896 the number born in the country has always exceeded the number of those originating in France. The proportion of those born in France is constantly decreasing, the number falling from 133,128 to 116,099 between 1931 and 1936, even though the total number of Europeans had increased by about 11 per cent. in that period.

Frenchmen born in Algeria have also gone in considerable numbers to the neighbouring protectorates of Morocco and Tunisia. Reference has been made above to the recent emigration of colonists to eastern Morocco. In Tunisia there are nearly 10,000 French citizens (about one-twentieth of the total European population) who were born in Algeria.

Most of the French citizens who were born in France have come from the southern half of the country, especially from Provence. They have been attracted by the proximity of Algeria and by the general similarity of climatic and agricultural conditions. Large numbers have come from the vine-growing departments of Hérault, Gard, Bouches du Rhône, and Pyrénées Orientales, especially after the crisis in the French wine industry caused by the phylloxera epidemic between 1860 and 1880. Many colonists have also come from the poverty-stricken areas of the Alpine departments, the island of Corsica, and elsewhere.

Other Europeans. The number of French persons and other Europeans was approximately equal until about 1886, but since then the French element (i.e. French citizens, including those naturalized) has increased rapidly—from 219,627 in 1886 to 819,450 in 1936. In the same period the number of foreigners has fallen from 225,493 to 126,563. These figures are to some extent unreal because by the law of 26 June 1889 all foreigners born in Algeria become French citizens on reaching the age of 21 unless they claim other nationality: consequently a fairly high proportion of foreign-born persons are now

automatically naturalized, though the statistics are not sufficiently detailed to indicate the exact number. In 1911 as many as 188,068 persons were naturalized: since then the figures have been much smaller, mainly because the children of naturalized persons are now ranked as 'French persons by origin'. Mixed marriages have also become more common, especially between Frenchmen and Spanish girls. In addition, the changed economic conditions since the War of 1914-1918 have greatly checked both emigration from the countries of Europe and immigration to countries like Algeria.

The most important groups of foreigners in Algeria are the Spanish, the Italian, and the Anglo-Maltese. There are also Germans, Swiss, Belgians, Poles, and Greeks, but these are only small in number and are generally losing themselves in the European community as a whole.

The *Spanish* form the largest and the most compact group, and numbered 92,290 in 1936, excluding 36,314 naturalized French citizens of Spanish origin. The tendency is for their number to decrease, and for the number of naturalizations to increase. The provinces of Alicante and Valencia have supplied most of the colonists, followed by the Balearic isles, Catalonia, Murcia, and Almeria. They live particularly in the western half of the country. In 1936 there were only 1,246 Spanish in the department of Constantine, but 24,995 in the department of Algiers and 65,895 in the department of Oran. In 1926 there were 96,869 Spanish in the last-named department: this marked decrease is explained partly by naturalization and partly by emigration to the eastern part of French Morocco. As recently as 1921 there were two persons of Spanish origin (including naturalized French citizens) for every person of French extraction in the department of Oran, and although the proportion is now more even, many areas are still unmistakably Spanish in character. This is especially true of Oran and its suburbs (which have more than 45,000 Spanish inhabitants), Sidi bel Abbès (with over 9,000), and St. Denis du Sig. The city of Algiers has more than 23,000 persons of Spanish origin. Generally speaking, the Spanish have proved hard-working and loyal colonists, who have been readily assimilated and do not constitute a serious minority problem. They live very simply, at a level little above that of the natives, and are often employed in lowly occupations, as navvies, dockers, and farm-labourers. Some of them, however, are enterprising farmers and plantation owners, as around Sidi bel Abbès, and skilled industrialists: the tobacco industry in Oran, for example, is largely controlled by the Spanish. The

Balearic islanders are mainly market gardeners in the suburbs of Algiers and Oran.

There were 21,009 *Italians* in Algeria in 1936, and 29,166 naturalized citizens of Italian origin: like the Spanish their numbers have decreased since 1931 (by over 5,000), whilst the number of naturalizations has increased (by about 1,700). They have come mainly from Sicily, especially the Trapani and Palermo districts, and from the southern parts of peninsular Italy, particularly the area around Naples. Numbers increase, unlike those of the Spanish, from west to east. In 1936 the department of Oran had only 2,777 Italians, whereas the departments of Algiers and Constantine had 8,212 and 9,963 respectively. Numbers have fallen considerably since 1911, when there were nearly 37,000 Italians in the country. This decline can be traced partly to increased naturalizations and partly to the effects of the economic depression on the mining industry in eastern Algeria, which was the source of employment for many of the Italians. In recent years the entry of Italians into Algeria has become negligible owing to the discouragement of emigration by the Fascist regime. The Italian population of the department of Constantine alone, where the large iron-ore mines and phosphate quarries are situated, declined by nearly 5,000 between 1931 and 1936. The largest concentrations are in Algiers and Bône, where there were 7,711 and 4,268 Italians respectively in 1936, together with several thousand naturalized persons of Italian origin. Besides being miners the Italians are also fishermen, general manual workers, and agricultural labourers. Compared with the Spanish, they have been very difficult to assimilate, largely as a result of propaganda from Italy.

In 1896 there were nearly 14,000 *Maltese* or *Anglo-Maltese* in Algeria, but by 1911 numbers had declined by one-half (6,907), and in 1936 there were only 2,982. The decline was due in part to naturalizations (for the Maltese have proved very easy to assimilate) and in part to the slowing-down of immigration. Four-fifths of the total live in the department of Constantine, especially in the ports of Bône and Philippeville, and in other coastal towns and villages such as la Calle. Most of them engage in fishing or in petty trade.

Of the *other Europeans* in the country the Germans alone have maintained their identity to some extent, and there are German villages at la Stidia (between Arzeu and Mostaganem) and Guelat bou Sba (north of Guelma). Altogether there were 10,282 Europeans in Algeria in 1936 apart from the French, Spanish, Italian, and

Maltese, and 2,085 naturalized persons of 'other European' origin. The majority of these foreigners live in Algiers (4,692 in 1936) and Oran (2,846), with smaller concentrations in Bône (713) and Constantine (454).

GAZETTEER OF TOWNS

THE gazetteer includes all the towns of Algeria with 5,000 or more inhabitants in the urban area, all the chief towns of the eighteen arrondissements (p. 11) and the four territoires (p. 14), and the principal communications centres of the Territoires du Sud. Of the twenty-one administrative centres only three have populations of less than 5,000—Tizi Ouzou in the department of Algiers and Ain Sefra and Touggourt in the Territoires du Sud. The towns are listed in alphabetical order. The names of all the ports of Algeria are also included in the appropriate place with references to the pages on which they are described in detail in Chap. XI. Fig. 14 shows the approximate location and size of all the towns in the gazetteer with the exception of the more southerly of the Saharan towns, and of the smaller ports; the latter are shown in Fig. 20.

The population statistics are generally based upon the official returns of the census of 1936. Where the total population of a commune de plein exercice differs greatly from the number in the urban area of the chief town of the commune (as explained on p. 38), and from the figure given in the Guide Bleu, *Algérie et Tunisie* (1938), both the commune and the urban figure are shown (e.g. Orléansville). Where the difference is relatively slight or where the figure in the Guide Bleu approximates to the population of the commune, only the latter figure is given. In the case of the communes mixtes and communes indigènes of the Territoires du Sud, where the urban population forms only a fraction of the total, only the former figure is given. The figures for the total population of Ouargla and Touggourt are taken from the Guide Bleu, since those given in the official census returns (320 and 270 respectively) obviously refer only to a small part of the sedentary population of the two oases: figures for the smaller Saharan centres are approximate only.

Much of the information given in the heading of each town described below is based on the directory *Didot-Bottin, Annuaire du Commerce* (Paris, 1939). Details relating to administration, police, justice, &c., are explained in Chap. IX. Communications are described in Chaps. XV–XVII.

ADJEROUD (PORT SAY), *see* p. 117.

AIN BEIDA. Population, urban 10,230 (1,499 Europeans); commune 15,753 (1,514 Europeans). Altitude 3,307 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Hospital. Hotels (2). Garages (5).

Ain Beida stands in the centre of the plain of the Constantine chotts, 46 miles south of Guelma. On the north-east, east, and south-east it is sheltered by a semicircle of wooded hills rising from 300 to 600 feet above the plain; 11 miles to the south-west lies the large salt lake of Garaet et Tarf; 20 miles to the south Djebel Tafrent runs in a south-westerly direction towards Khenchela. The town is the centre of a fairly rich agricultural region, which is watered by many wells and some springs; the most important is that which gave the town its name ('the white spring'), yielding about 120 gallons a minute. There are two forts, built by the French in 1848 and 1850. The market is held on Mondays. In several of the neighbouring hills there are remains of lead and copper mines worked by the Romans.

Ain Beida was founded as a military post by the French between 1848 and 1850 to control the Harakta tribe, a powerful and warlike faction of arabized Berbers, who dominated the frontier region from Souk Ahras to the Monts des Nemencha. These people have since been transformed into peaceful farmers.

Communications

Rail: The narrow-gauge railway from Ouled Rahmoun, the junction for the normal-gauge line from Algiers to Constantine, passes through Ain Beida, and is continued south for about 6 miles where it divides, one branch going south-east to Tébessa and Tunisia, and the other to Khenchela, 30 miles south-south-west.

Road: Ain Beida stands at the cross-roads of the Route Nationale from Constantine to Tébessa and the road from Guelma to Khenchela.

AIN SEFRA. Population 2,541 (923 Europeans). Altitude 3,510 feet. Chief town of the Territoire d'Ain Sefra, a commune mixte, and an annexe. Hospital (military). Bureau arabe. Meteorological station. Wireless. Hotels (3). Garages (2).

Ain Sefra, 307 miles south of Oran and 48 miles east of the Moroccan frontier, lies between two ridges trending from north-east to south-west in the Monts des Ksour. Djebel Aissa is to the north and



2. *Beni Saf*



3. *Bou Saada*

Djebel Mekter to the south; the latter is separated from Ain Sefra by an expanse of sand-dunes from 10 to 12 miles wide. An attempt has been made to fix these dunes by planting poplars, willows, and other varieties of trees. The town lies on either side of the Oued el Breidj, which curves round Djebel Mekter and continues southward as the Oued Namous; it is usually dry. The European settlement, which was destroyed by flood in 1904, lies on the northern bank of the oued near the railway station, which is fortified. On the southern bank is the military station set against the dunes which includes barracks, other military services, and the bureau arabe. To the south-west is the ksar or native village, where carpets are made by the natives. The market for skins, wool, sheep, and salt is held on Mondays and is visited by many natives of French Morocco.

Communications

Rail: Ain Sefra is on the narrow-gauge line from Oran and Perrégaux to Colomb Béchar and Kenadza.

Road: The town is on the main road from Mostaganem through Mascara and Saida to Colomb Béchar. There are also roads north-east to Géryville and north-west to Matarka in French Morocco.

AIN TÉMOUCHENT (Photo. 47). Population 18,521 (10,192 Europeans).

Altitude 820 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Hospital. Fire brigade. Hotels (5). Garages (12).

Ain Témouchent is a busy and prosperous town, about 20 miles south-west of Oran on the right bank of the Oued Senane, a tributary of the Rio Salado. It stands in the midst of very fertile country, its black soils being enriched by the decomposition of basalt, and vineyards, for which it is renowned, encircle the town. On the west side of the river is an experimental farm. The surrounding country is undulating with low ridges rising from 250 to 350 feet above the general level of the land, and cut by steep-sided ravines. One of these, the Oued Témouchent, forms the southern boundary of the town. About 6 miles to the south-west is the Seba Chioukh range, a westerly extension of the Monts du Tessala. The town is planted with avenues of trees, and the gardens and orchards are well cultivated. There is a plentiful water-supply from wells. The market is held on Thursdays.

Ain Témouchent is built on the site of the Roman Albulae, of which there are many remains, such as columns, statues, and bas-

reliefs. The Arab settlement was known as Ksar ibn Senane. It was attacked by Abd el Kader in 1845.

Communications

Rail: Ain Témouchent is the terminus of the normal-gauge line from Oran, which follows the northern shore of the Sebkha d'Oran.

Road: The northern Route Nationale from Oran to Tlemcen passes through the town, and secondary roads lead south-east to Sidi bel Abbès, west to the port of Beni Saf, and north-east to Ain el Arba and along the southern edge of the Mléta plain.

ALGIERS (ALGER), *see* p. 151.

ARZEU (ARZEW), *see* p. 134.

AZEFFOUN (PORT GUEYDON), *see* p. 165.

BATNA (Photo. 5). Population 15,504 (3,735 Europeans). Altitude 3,426 feet. Chief town of an arrondissement, a commune de plein exercice, and a military subdivision. Brigade de gendarmerie. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 110/190). Hospital. Meteorological station. Fire brigade. Hotels (5). Garages (4).

Batna, 60 miles south-south-west of Constantine and 55 miles north-east of Biskra, lies on the right bank of the Oued Tilatou in a well-watered plain between two ridges. To the south are the northern ranges of the Aurès mountains, and to the north the Monts de Batna, which are well wooded and generally rise to heights of between 5,000 and 5,800 feet, with outstanding peaks such as Djebel Touggour and the Pic des Cèdres (6,910 ft.), west of Batna. The town is rectangular in plan and has broad streets bordered by trees. The principal artery of the town, running north-west to south-east, is the Avenue de la République which is cut at right angles by the Avenue de France in the Place de la République, the centre of the town. In the centre are grouped the principal public buildings, the theatre, and the market. Batna has modern amenities, including schools, baths, and electric light. It is an excellent centre for tourists wishing to visit the towns of historic interest, such as Lambessa (Lambèse) and Timgad, and the northern Aurès. The military quarter, which is east of the town and is surrounded by a defensive wall, has barracks capable of accommodating 4,000 men, shops, and a hospital. The water-supply is from wells. The ordinary market is held daily, and the cattle market on Saturdays.

Batna dates from 1844, the date of the expedition to occupy Biskra,

when a camp was built to protect the route from the Tell to the Sahara as well as to serve as a base for expeditions in the Aurès. Later the camp was moved a mile to the east to a place called Ras el Aioun Batna by the Arabs, and it was around this military station that the town, for some time called Nouvelle Lambèse, was erected in 1848. A year later it was decided to call it Batna.

Communications

Rail: Batna is on the Constantine–Biskra normal-gauge line.

Road: The Route Nationale from Philippeville and Constantine to Biskra passes through the town, and there are good roads east to Lambèse, Timgad, and Khenchela, and north-west across the mountains to Corneille, Ampère, Colbert, and Sétif.

BENI ABBÈS (Vol. I, Photo. 16). Population *c.* 5,000 (200 Europeans).

Altitude 1,617 feet. Administrative centre of the Saoura annexe.

Infirmery. Meteorological station. Wireless. Hotels (2).

Beni Abbès is 104 miles south of Colomb Béchar and 206 miles south-west of Ain Sefra, at the western end of the western (Saoura) Erg. It stands on the side of a small plateau overlooking the valley of the Saoura; above it is the military post. The Saoura, which marks the division between the stony desert or hammada extending westward and the sand-dunes of the erg to the east and south, sometimes carries a considerable amount of water in winter; in its bed there are gardens and palm groves with about 8,000 date-palms. Many of the streets are roofed and are so dark that even during the day it is difficult to see one's way without torches.

Communications

Road: The Tanezrouft route from Ain Sefra and Colomb Béchar passes through Beni Abbès and continues south to Gao in the French Sudan. Near Ksabi, 145 miles south of Beni Abbès, a track branches off east to Timimoun, el Goléa, and Ouargla.

BENI SAF, *see* p. 121.

BISKRA (Photos. 4, 118). Population 21,323 (2,196 Europeans).

Altitude 366 feet. Chief town of a commune de plein exercice, a commune mixte, and an annexe. Brigade de gendarmerie. Electricity (3-phase, 115/200). Drainage. Hospitals (2). Meteorological station. Hotels (10). Garages (6).

Biskra lies in the Sahara, 150 miles south-west of Constantine, on

the right bank of the Oued Biskra. It is the capital of the Ziban, which is a region of steppes, dotted with oases, stretching east and west of Biskra at the foot of the south-western foothills of the Aurès and the eastern end of the Monts du Zab. Two ridges, trending from north-east to south-west, overlook the town, one about a mile to the south-west and the other 5 miles to the north-west: the latter is divided by the Col de Sfa into two parts, Djebel bou Ghezel (1,329 ft.) and Djebel el Mbaga (1,310 ft.). Because of its excellent winter climate (cf. climatic statistics, Vol. I, Appendix B) Biskra is a popular tourist centre with a season lasting from November to April.

The town of Biskra is surrounded by a wall and a ditch, outside which the encircling suburbs form a vast garden covering an area of 6 square miles and supplied with water by wells. Biskra is divided into two distinct parts: the native quarter, stretching through the palm groves and gardens to the south-east, and the French quarter, to the north of the oasis, near the station and south-west of the Fort St. Germain. The French quarter consists of two main streets proceeding south-east from the station, the Rue Berthe and the Boulevard Carnot, from which other streets branch off at right angles. These are bordered by palm trees and lined with European houses built in the typical style of a French winter resort; many of them have only one story, and sometimes only a ground floor. This quarter is well provided with shops, hotels, public gardens, and churches. There is also a casino. East of the station is the Fort St. Germain, named after an officer killed in the Zaatcha insurrection of 1849. Besides its strategic importance as a watch-tower of the Sahara, the fort guards the water which secures the fertility of the whole oasis. It is so extensive that it was capable of sheltering the whole of the civil population during the rebellion of 1871. It contains barracks, a hospital, and administrative offices. On the southern outskirts of the town is the Jardin Landon or Villa de Bénévent, an enclosure of about 25 acres where many kinds of flowers and flowering shrubs are grown. The market is held on Mondays, and trade is principally in wool and dates.

The oasis of Biskra stretches south from the town on the right bank of the Oued Biskra for a distance of 3 miles; it is less than 1 mile broad, covers an area of 3,250 acres, and contains 150,000 date-palms and many thousands of fruit trees. Scattered among the trees are villages of houses built of dried mud with roofs and doors made of palm wood. The name 'Old Biskra' applies to seven or eight of these villages. About $3\frac{1}{2}$ miles to the west of Biskra are the sulphurous



4. *Biskra*



5. *Batna*



6. Constantine from the north-west

springs of Hammam Salahine or Fontaine Chaude: they yield 18,750 gallons per hour, and the temperature of the water is 115° F. The buildings include separate departments for Europeans and natives, and consist of baths, vapour baths, electrical appliances, and a gymnasium. The waters are recommended for rheumatism, tuberculosis, and many other complaints.

Biskra occupies the site of the Roman town of Vescera. It had a Christian church and was the seat of a bishop. In 662 Sidi Okba, the Arab conqueror, passed through Biskra and twenty years later died and was buried nearby (cf. Vol. I, Photo. 59). In the twelfth, thirteenth, and fourteenth centuries the town and the whole of the Ziban were under successive Arab dynasties, and finally fell to the Turks in 1552. In 1844 the Duc d'Aumale occupied Biskra and left a small garrison of native soldiers commanded by five French officers. Soon afterwards they were massacred by fanatical tribes, and a large force had to be organized to subdue the country. In 1849 a rising in the Ziban ended with the seizure and destruction by the French of Zaatcha, a village to the south-west.

Communications

Rail: Biskra is the terminus of the normal-gauge line from Philippeville and Constantine. A narrow-gauge line continues south to Touggourt with a branch-line from Oumache to Tolga.

Road: Biskra is on the Route Nationale south from Constantine to Batna and Touggourt. A good road runs west to Bou Saada and other roads lead north-east to Arris in the Aurès and south-west to Ouled Djellal, continuing by a devious track to Laghouat.

BLIDA (Fig. 15; Vol. I, Photo. 7). Population 44,043 (13,930 Europeans). Altitude 785 feet. Chief town of a commune de plein exercice. Compagnie de gendarmerie. Court of First Instance. Electricity (3-phase, 110). Gas. Drainage. Hospital (military). Meteorological station. Wireless. Fire brigade. Hotels (9). Garages (10).

Blida is 26 miles south-west of Algiers on a great alluvial fan on the right bank of the Oued el Kebir, 4 miles above its confluence with the Oued Chiffa. North of the town stretches the fertile and well-cultivated plain of the Mitidja, here about 10 miles wide, and famous for its production of cereals, vines, olives, and fruit. On the south is Djebel Ferouka, a ridge covered with scrub and woodland,

and part of the Blida Atlas, with its highest peak (5,118 ft.) $4\frac{1}{2}$ miles south-east of the town. There is an abundant supply of water from springs and from the Oued el Kebir, which provides power for large



FIG. 15. *Blida*

The symbols used in this map also apply to Figs. 15-19 and 22-45

flour-mills and several factories, and also supplies the town and its numerous fountains and irrigated gardens.

The older part of Blida was surrounded by a wall 13 feet high and pierced by six gates. The line of these walls is marked by the Boule-

wards de Metz, de Malakoff, Beauprêtre, Bonnier, de Paris, and de Strasbourg, as in recent years the town has expanded considerably beyond them on all sides except the south, where growth is limited by the Oued el Kebir. The centre of the town, the Place Clemenceau, formerly the Place d'Armes, is surrounded by arcaded houses and shaded by a double row of plane trees: it is the focus of four main streets intersecting at right angles, the Rues d'Alger, Tirman, and Bizot, and the Boulevard Trumelet. Blida has been damaged twice by earthquakes, so that there are few remains of the old town of the Turkish occupation, except for two mosques, the Djama et Terk and the Djama Sidi Mohammed ben Sadoun. The public buildings and private houses are mainly of brick, painted white, and are European in character. The barracks in the south and south-west near the river can accommodate 2,000 men: those in the northern part of Blida are for cavalry, and nearby is a stud of pedigree Arab horses. In the eastern part of the town near the native market is the quarter of the local craftsmen who make lace, embroidery, carpets, furniture, native woodwork, and leather goods. To the north of Blida are the famous orange groves where hundreds of thousands of oranges, lemons, tangerines, and almonds grow; these fruits form the principal export of the town. The villages of Joinville and Montpensier, which owe their origin to military camps established by Marshal Valée in 1838, are $1\frac{1}{2}$ miles to the north-west and 1 mile to the north-east respectively.

Blida occupies the site of a Roman military station, but the present town was founded in 1553 by Ahmed el Kebir, who installed Andalusian immigrants skilled in irrigation, orange production, and embroidery on leather. Khair ed Din enlarged the town and built a mosque, baths, and a communal oven, and under the Turks it was of considerable importance. In 1825 an earthquake destroyed the town, which was rebuilt on the same site. In 1830 the French under Generals Bourmont and Clauzel occupied Blida for a short time, but were obliged to retire to Médéa: four years later the Duc de Rovigo sacked the town, but was also forced to evacuate it. In May 1838 Marshal Valée advanced against Blida, and finally occupied it a year later. Since then, in spite of a second earthquake in 1867 which caused severe damage, the town has grown steadily.

Communications

Rail: Blida is on the Algiers–Oran normal-gauge line, and is the junction for the narrow-gauge line south along the Chiffa valley to

Médéa, Boghari, and Djelfa. The station is three-quarters of a mile north-west of the town.

Road: The Route Nationale from Algiers to Laghouat passes through the town, and there are good roads north-east to l'Arba and north to Koléa and the coast. The road west to Bourkika is part of the Route Nationale from Algiers to Miliana and Oran.

BOGHARI. Population 5,572 (866 Europeans). Altitude 2,047 feet.

Chief town of a commune de plein exercice and a commune mixte.

Electricity (3-phase, 115/200). Drainage. Hospital. Hotel. Garages (2).

Boghari is 26 miles south of Médéa at the junction of the Tell and the steppes. It lies on the right bank of the upper Chélif as the river makes its way through the eastern end of the Ouarsenis. The wooded range of the Ouarsenis with ridges rising to 3,300 and 4,000 feet stretches to the north, east, and west, while on the south indeterminate ridges lie on each side of the Chélif downstream of its course across the monotonous steppe, where it is known as the Oued Nahr Ouassel. Excellent cereal crops grow on the steppes when the rains are sufficient. About $2\frac{1}{2}$ miles north-west of Boghari is the village and fort of Boghar, known as the 'balcon du sud' because its position commands the Tell, the Chélif valley, and the High Plateaux. The native village or ksar of Boghari, with 2,800 inhabitants (many of them from the Monts des Ouled Nail), is east of the modern town on a spur of one of the surrounding ridges. The town is the commercial centre of the surrounding region, especially for the pastoral tribes who bring their livestock, wool, and cereals to the market which is held on Mondays.

Communications

Rail: Boghari is on the narrow-gauge railway from Blida (the junction on the Algiers–Oran normal-gauge line) to Médéa and Djelfa.

Road: The Route Nationale from Algiers and Blida continues south through Boghari to Djelfa and Laghouat. There is a winding, second-class road west to Boghar and Teniet el Had and a third-class road eastward to Sidi Aissa.

BÔNE (BONA), *see* p. 183.

BORDJ BOU ARRÉRIDJ. Population, urban 4,936 (1,881 Europeans); commune 14,773 (1,928 Europeans). Altitude 2,953 feet. Chief

town of a commune de plein exercice. Brigade de gendarmerie. Electricity (3-phase, 115/200; 3-phase, 230/400; continuous, 220). Drainage. Hospital. Meteorological station. Fire brigade. Hotels (5). Garages (4).

Bordj bou Arréridj is 50 miles south-south-west of Bougie and 42 miles west of Sétif. It stands on the left bank of the Oued bou Arréridj, a tributary of the Oued Bieta, and in the Medjana plain, here about 10 miles wide. The Biban massif is to the north and the Monts du Hodna to the south. The town is well laid out with straight streets, and is the centre of a cereal-producing and stock-rearing district. Phosphates occur in Djebel Maadid to the south. The market is held on Wednesdays. Water-supply is from springs.

Communications

Rail: Bordj bou Arréridj is on the normal-gauge line from Algiers to Constantine. The station is south-west of the town.

Road: The Algiers–Constantine Route Nationale passes through Bordj bou Arréridj and a second-class road runs south-west to Bou Saada. Narrow third-class roads run north-west to Allaghan on the Route Nationale from Maillot to Bougie, and north-east to Lafayette.

BOUFARIK (Vol. I, Photo. 6). Population 15,593 (5,334 Europeans).

Altitude 192 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 110/190). Drainage. Hospital. Schools. Fire brigade. Hotels (5). Garages (11).

Boufarik lies in the centre of the plain of the Mitidja, 16 miles south-west of Algiers and $8\frac{1}{2}$ miles north-east of Blida. It stands between two of the many streams that water this plain, the Oued el Khemis on the west and the Oued Bouchemla on the east of the town. About 6 miles to the north rise the hills of the Sahel of Algiers, between 500 and 750 feet high, and roughly the same distance southward are the first ridges of the Blida Atlas.

The town, which dates from 1836, is rectangular in plan with straight streets oriented north–south and cut by others at right angles. Formerly Boufarik was surrounded by marshes, and many of the first colonists died of fever and malaria and the settlement had to be re-established several times. To-day, however, the district is thoroughly drained, and there is a supply of pure water from wells; the town is regarded as a model agricultural settlement. Boufarik

is the vine-growing centre of the Mitidja, and the vineyards surrounding the town produce more than two million gallons of wine a year; oranges, tangerines, and other fruits are also grown extensively. Other crops include wheat, barley, oats, tobacco, fodder crops, and vegetables. Flowers are grown in nursery gardens and distilled for perfume; the distilleries of Boufarik are associated with those of Grasse, in the south of France. The market, held on Mondays just outside the town on the south-eastern side, is one of the most important in Algeria.

Communications

Rail: Boufarik is on the Algiers–Oran normal-gauge line: the station is south-east of the town.

Road: The Route Nationale from Algiers to Oran passes through the town, and second-class roads lead north-west to Koléa and the coast, north to Zéralda, west and south-west through Oued el Alleug to the Blida–Bourkika road, and east to l'Arba.

BOUGIE, *see* p. 166.

BOU SAADA (Photo. 3). Population 6,663 (905 Europeans). Altitude 1,903 feet. Chief town of a commune mixte. Electricity (3-phase, 115/200). Drainage. Hospital. Hotels (5). Garages (5).

Bou Saada is in the south-western corner of the Hodna plain about midway between Boghari and Biskra, and 65 miles north-east of Djelfa. It stands on the left bank of the Oued bou Saada, which empties into the Chott el Hodna 15 miles to the north-north-east. Sand-dunes, formerly mobile but now fixed by tamarisk trees, stretch north of the town and its oasis towards the chott; to the south the last ridges of the Monts des Ouled Nail trend in a south-west to north-east direction on either side of the oued, with Djebel Moubakrera (3,465 ft.) to the north and Djebel Kerkada (3,118 ft.) on the south. There are two distinct quarters in the town lying on either side of the Place du Colonel Pein; to the north is the native ksar, with winding streets, built on the slope descending to the oued, and to the south is the European quarter, which is well laid out and contains all the public buildings, including hotels, the post office, the police station, and schools. Fort Cavaignac and the Officers' Club stand on a hill on the west. The oasis, which is north of the town, contains about 10,000 date-palms and is watered by the Oued bou Saada, the banks of which rise steeply from the valley bottom. The town's water-supply is from springs. Bou Saada was occupied by the French in 1849 after



7. Constantine from the south-west



8. Beni Isguen, with Ghardaia and Melika in background



9. Ghardaia

the Zaatcha revolt, when Bou Ziane, a local chief, rallied the neighbouring tribes and for 52 days fought the French under General Herbillon.

Communications

Road: Bou Saada is an important route-centre; a Route Nationale runs north-west to Aumale and Algiers, and secondary roads radiate north-east to Bordj bou Arréridj, south-east to Biskra, south-west to Djelfa. A track leads south-south-west to Laghouat.

BREIRA, PORT, *see* p. 145.

CALLE, LA (PORT DE LA CALLE), *see* p. 189.

CASTIGLIONE, *see* p. 151.

CHERCHEL (SHERSHEL), *see* p. 147.

COLLO, *see* p. 174.

COLOMB BÉCHAR. Population 3,749 (995 Europeans). Altitude 2,992 feet. Chief town of a commune mixte and an annexe, and headquarters of the military command of the Territoire d'Ain Sefra. Hospital (military). Infirmary. Meteorological station. Wireless. Hotels (5). Garage.

Colomb Béchar is 123 miles south-west of Ain Sefra and 15 miles south of the boundary of French Morocco. The rugged slopes of Djebel Béchar rise to 1,600 feet above the general level of the country, 5 miles south-east of the town. Along the Moroccan frontier to the north are Djebels Horreit and Antar, and to the west, beyond Kenadza, is broken, chaotic country known as *chebka* (Vol. I, p. 69). Colomb Béchar is divided into two quarters, the European and military post with modern houses, and the native town with covered-in streets. It is surrounded by extensive palm-groves growing in the valley of the oued, which is dammed and forms a lake. Local manufactures include gold and silver jewellery made by Jews from Tafilelt, and leatherwork. There is a daily market, and a considerable trade in skins, sugar, coffee, tea, cloth, and dates.

Communications

Rail: Colomb Béchar is on the narrow-gauge line from Oran and Perrégaux to Kenadza.

Road: The town is an important trans-Saharan route centre; the Tanezrouft route from Ain Sefra to Gao in the French Soudan passes

through the town, and other tracks lead south-west to Abadla and Tabelbala, and west-south-west to Kenadza and Meridja.

CONSTANTINE (Figs. 16, 73, Photos. 6, 7, 83; Vol. I, Photos. 2, 14).

Population 113,777 (54,409 Europeans). Chief town of the department of Constantine, an *arrondissement*, a *commune de plein exercice*, and a military division. *Compagnie de gendarmerie*. *Garde républicaine mobile*. Courts of Assize and First Instance. Electricity (3-phase, 110/200). Gas. Drainage. Hospitals (1 civil, 1 military). Meteorological station. Wireless. Fire brigade. Hotels (26). Garages (24).

Constantine, the third city of Algeria, lies in the *Monts de Constantine*, 40 miles south of Philippeville and 89 miles south-west of Bône, its principal outlets to the Mediterranean. It is a natural fortress overlooked by *Djebel Chettaba*, a ridge trending from south-west to north-east, and continued across the *Oued Rummel* as *Djebel Ouasch*. The town is built on a rocky plateau shaped like a trapeze and isolated on three sides by gorges which drop perpendicularly to the bed of the *Rummel*. The plateau rises to 2,181 feet in the northern angle by the *Kasba* and sinks to 1,920 feet near *Sidi Rached*. The bed of the *Rummel*, which is between 350 and 950 feet below the town, lies in a ravine of varying width; at its narrowest it is only 15 feet wide, but it is mostly between 65 and 75 feet (Vol. I, Photo. 2). A tributary of the *Rummel* flowing in a gorge of roughly similar depth isolates Constantine on the west, and it is only to the south-west that a narrow, steep-sided isthmus gives access to the town. The only other entrance to the city until 1912 was by an iron bridge built in 1863, the *Pont d'el Kantara*, which spanned the *Rummel* in the north-eastern part of the town and gave access to the railway station. In 1912 two new bridges were started, the *Sidi Mécid* suspension bridge and the *Pont de Sidi Rached*. The former is 551 feet long and 669 feet above the river, and is at the northern end of the *Rue Damrémont*, linking the *Kasba* with the road to the *Fort de Sidi Mécid*. The *Pont de Sidi Rached* is a long viaduct on the south-eastern side of the town, connecting *Coudiat Aty* and its suburbs with the railway station. More recently a foot-bridge (the *Passerelle Perrégaux*) has been built near the *Medersa* to link the centre of the city with the station.

Since the French occupation new quarters have been built beyond the limits of the old town, mainly to the south-west on the plateau of *Coudiat Aty*, where are the suburbs of *Coudiat Aty*, *St. Jean*, *St.*

FIG. 16. *Constantine*

Antoine, and Bellevue, and on the opposite bank of the Rummel near the railway station—the suburbs of el Kantara, Lamy, Sidi Mecid, Mansoura, and Sidi Mabrouk. European streets have been built in the old town, thus altering the character of the place, especially to the west between the Rue de France, which runs roughly through the centre of Constantine from north to south, and the Boulevard Joly de Brésillon. East and south-east between the Rue de France and the Rummel gorges are the native quarters, which have remained almost intact, with narrow streets and houses nearly meeting overhead. Each trade has a special quarter, and there are entire streets of tanners, saddlers, or shoe-makers. The centre of the city is the Place Nemours, formerly called the Place de la Brèche; around it are the market, the theatre, the Law Courts, and the chief hotels and cafés. South of the Place Nemours two squares, the Square Valée and the Square de la République, have been laid out as public gardens. Fig. 10 illustrates the growth of the population of Constantine since 1856.

Of the public buildings the most interesting are those built before the French occupation of the city. The palace of Ahmed Pasha, the last Bey of Constantine, built between 1830 and 1836, is one of the finest specimens of Moorish architecture of the nineteenth century. The mosque of Sidi el Kattani, or Salah Bey, dates from the end of the eighteenth century, the cathedral (the ancient mosque of Souk er Rezel) is about a century earlier, and the mosque of Sidi el Akhdar, with a beautiful minaret nearly 80 feet high, was completed in 1743. The Kasba, in the north of the city, dates from Roman times and has been occupied in turn by Byzantines, Berbers, Arabs, and Turks, and contains numerous remains of Roman buildings. It has been rebuilt, and now includes the barracks housing 3,000 men, the military hospital, and the arsenal: the Roman cisterns are still used as reservoirs. Three other military establishments are the Bardo (the old Turkish cavalry barracks in the south), the cavalry barracks at Mansoura on the right bank of the Rummel, and the Fort de Sidi Mecid.

The native industries of Constantine are chiefly the manufacture of leather and woollen goods. About 100,000 burnous, haiks, and gandouras (Vol. I, p. 221) of the finest wool and silk are made annually. The corn market near the Square Valée is the most important in Algeria. There is also an active trade in esparto grass, olive-oil, and wine as well as in native jewellery and wooden, metal, and leather articles made for the tourist trade. There are numerous factories producing flour, biscuits, beer, corks, bricks, and cement.

Constantine was originally called Cirta, from the Phoenician

word meaning city. It was the capital and commercial centre of the Numidian kingdom before the Roman conquest. Its kings fought against Carthage and took part in the Roman civil wars, but in 46 B.C. the city was given to the Italian Sittius, a supporter of Julius Caesar, as a reward for his defeat of Juba, an adherent of Pompey, and was colonized by Roman settlers. For the next three centuries the city was head of a confederation which included Mileu (Mila), Chullu (Collo), Rusicade (Philippeville), and, later, Cuicul (Djemila). It was laid in ruins in the dynastic wars of Maxentius, but was restored in A.D. 313 by Constantine, who gave it the name which it still retains. It was not captured during the Vandal invasion of Africa, but from the seventh century onwards successive Arab dynasties looted it. During the twelfth century its commerce revived and attracted merchants from Pisa, Genoa, and Venice. The Turks took Constantine in the sixteenth century, when it became the seat of a bey, who was subordinate to the Dey of Algiers. Most of the Moslem buildings are due to Salah Bey, who ruled from 1770 to 1792. In 1826 Constantine asserted its independence of the Dey of Algiers and was governed by Hadji Ahmed, the choice of the Kabylie peoples. Ten years later the French under Marshal Clauzel made an unsuccessful attempt to storm Constantine by night, attacking from el Kantara, but they suffered heavy losses. In the following year another expedition of 10,000 men under General Damrémont approached the town by the connecting isthmus, and in the assault led by Marshal Valée succeeded in taking the town, although with heavy casualties. Ahmed Bey, however, escaped and maintained his independence in the Aurès mountains for eleven years.

Communications

Rail: Constantine is connected by a normal-gauge line to Philippeville. This line continues south of the town to join the main line from Algiers to Tunis at le Khroub. From the latter line there are branches at Ouled Rahmoun for Khenchela and Tébessa (narrow gauge), at el Guerrah for Biskra and Touggourt (normal gauge to Biskra, narrow gauge beyond), and at Duvivier for Bône (normal-gauge electrified line). The railway station is on the east side of the Rummel.

Road: From Constantine a network of Routes Nationales and second-class roads radiate north-east to Philippeville, north-west to Collo and Djidjelli, west to Sétif and Algiers, south-west to Batna and Biskra, south-east to Ain Beida and Tébessa, and east to Guelma and Souk Ahras (Fig. 73).

DELLYS, *see* p. 162.

DJIDJELLI (JIJELLI), *see* p. 172.

DUPLEIX, *see* p. 146.

EL GOLÉA, *see* Goléa, el (p. 75).

EL OUED, *see* Oued, el (p. 94).

FALAISES, LES, *see* p. 172.

FREND. Population 5,205 (904 Europeans). Altitude 3,445 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Hospital. Hotels (2). Garages (3).

Frenda, 55 miles south-east of Mascara, stands at the eastern end of the Monts de Saida. The town, with its native village of about 4,000 inhabitants, is on a small wooded plateau between two tributaries of the Oued Mina, the Oued et Taht, which is south of Frenda and flows in a north-westerly direction to the main stream, and the Oued el Ouhou, which flows in a northerly direction. North of Frenda there is a low hill, Djebel Zaouil, and on the south, on the opposite side of the Oued et Taht valley, are three hills isolated from the main range. The town, which retains its Berber character, has a flour-mill, and a school for native work such as carpets, embroidery, and lace. The water-supply is from springs. Sheep are reared in the district, and cereals, vines, and alfa are brought to the market, which is held on Thursdays. There are numerous dolmens and prehistoric rock sculptures in the district.

Communications

Road: The Route Nationale from Mascara to Tiaret passes through Frenda. Secondary roads lead north to Prévost-Paradol and south and south-east across the High Plateaux to Géryville and Aflou respectively.

GHARDAIA (Photos. 8, 9; Vol. I, Photo. 17). Population 14,144 (257 Europeans). Altitude 1,716 feet. Chief town of a commune indigène and an annexe. Electricity (3-phase, 110/190). Hospital. Bureau arabe. Meteorological station. Hotels (4). Garages (4).

Ghardaia, with the nearby villages of Melika and Beni Isguen, is the chief town of the Mزاب. It stands in the bed of the Oued Mزاب

(or Oued el Abiod), at the foot of the hills which overlook the southern side of the valley. The whole of the surrounding country consists of *chebka* (Vol. I, p. 69), that is, gently undulating limestone plateau seamed with a complicated pattern of oued beds, which have cut into the plateau but rarely carry water. Ghardaia is built in the form of a pyramid with the houses rising in terraces, which are sometimes built upon arcades. There are three distinct quarters in the town, each isolated from the other by walls. In the centre—the highest part of the town—is the Mozabite quarter built round an arcaded square surmounted by a huge minaret; here the elders assemble, and a market is held on Fridays. On the east is the Jewish quarter where the jewellers, tanners, armourers, and cobblers live; there are no gardens in this quarter, but many wells. The south-western quarter is occupied by the Medabia, who come from Lelmaia in the southern part of Djebel Amour and number roughly 700. The military compound, comprising barracks, bureau arabe, and hospital, stands on a small hill downstream, and a little south of Ghardaia. The gardens of the oasis, which contain 60,000 date-palms, lie upstream and stretch for nearly 5 miles; they are irrigated by water drawn from wells often 230 feet deep, and six dams have been built across the oued to store surplus rainwater. Besides dates, Ghardaia specializes in embossed leatherwork, carpets, brassware, and ornamental woodwork.

Ghardaia was founded in the eleventh century by the Mozabites, a sect regarded as heretical by orthodox Moslems, after their expulsion from the Ouargla region, whither they had fled from the Tell (Vol. I, p. 231). In 1853 the town came under French protection, and in 1882 was annexed without resistance to the French Republic.

Communications

Road: The Route Nationale from Algiers to Laghouat is continued southward through Ghardaia to el Goléa. There are also roads north-east to Guerrara and Touggourt and south-east to Ouargla.

GOLÉA, EL (Photo. 10; Vol. I, Photo. 28). Population 5,219 (29 Europeans). Altitude 1,283 feet. Section of the commune indigène of Ghardaia. Infirmary. Bureau arabe. Meteorological station. Wireless. Hotel. Garage.

El Goléa lies at the eastern end of the western (Saoura) Erg, about 170 miles south-west and south-south-west of Ouargla and Ghardaia respectively, and 225 miles south of Laghouat. The town is at the

foot of rocky cliffs in the valley of the Oued Seggueur. To the west is a great expanse of sand desert, and to the east hammada or stony desert. The native settlement has mud houses similar in shape to the *tatas* of the French Sudan. The European town has modern buildings including the bureau arabe, infirmary, and barracks: in the centre is a small market place with a mosque. The old ksar, the buildings of which are slowly falling into ruin, is to the east on a hillock overlooking the oasis; there are remains of the double walls of the stronghold, of the rock-dwellings, and of the mosque. The oasis has 100,000 date-palms and many fruit-trees, with flower and vegetable gardens, which are watered by fifteen artesian wells. Local products made in workshops directed by the Soeurs Blanches include tents, cushions, and table-linen.

El Goléa was first visited by the French in 1863, annexed ten years later by General de Gallifet, and definitely occupied in 1891, when it became an important military post. The district is peopled by the Chaanba Mouadhi, a branch of the Madhi tribe of Laghouat, who were first recruited by General Laperrine to serve as méharistes (Camel Corps) for the pacification of the Sahara.

Communications

Road: The Ahaggar route from Laghouat and Ghardaia passes through el Goléa and continues south through In Salah and Tamanrasset to Zinder and Kano in northern Nigeria. A track leads north-east to Ouargla, and 39 miles south of el Goléa there is a branch south-west to Timimoun.

GOURAYA, *see* p. 146.

GUELMA (Photo. 12). Population 15,960 (3,475 Europeans). Altitude 971 feet. Chief town of an arrondissement and a commune mixte. Brigade de gendarmerie. Court of First Instance. Electricity (3-phase, 115/200). Drainage. Hospital. Meteorological station. Hotels (3). Garages (8).

Guelma is south-east of Djebel Debar, 32 miles south-west of Bône, and on the right bank of the Oued el Rabate, a mile above its confluence with the Oued Seybouse. The town is on the southern edge of the Seybouse valley, here under 2 miles wide, and is enclosed on both sides by mountains rising fairly steeply to heights of 1,320 to 1,980 feet. The lower slopes are covered with olive-groves, but higher up these are replaced by scrub. Guelma is an old fortified town



10. *El Goléa*



II. *Orléansville*



12. *Guelma*

surrounded by walls: its streets are well laid out and shaded by trees, and the public gardens are well kept. The centre of the town is the Place St. Augustin; on the south, where the ground starts to rise to the foothills, the Kasba encloses the military quarter; to the west is the native quarter. A museum contains remains found near Guelma, and the ruins of Roman baths and a theatre, some portions of which were in a fair state of preservation, have been reconstructed. About 5 miles west of Guelma on the main road are the extensive ruins of Announa, the Roman Thibilis. An important cattle market is held from midday on Sunday to Monday evening and an annual cattle-fair on the last Sunday in April; the district is famous for its cattle-breeding. East of Guelma is a native agricultural school with an experimental farm attached. Carpet making is an important local industry. There is an ice factory in the town. Water is obtained from springs.

Guelma is the ancient Calama, which existed before Roman times: under the empire it became a Roman colony. Later, one of its bishops was Possidius, the biographer of St. Augustine. The modern town owes its origin to Marshal Clauzel, who was impressed by the strategic importance of the site and established a permanent camp in 1836.

Communications

Rail: Guelma is on the main railway line from Constantine to Souk Ahras and Tunisia, with a connexion to Bône at Duvivier. The station is north-east of the town.

Road: The Route Nationale from Constantine to Souk Ahras passes through Guelma. The main road from Philippeville and St. Charles enters the town from the north-west, and the Route Nationale from Bône from the north-east. Other roads lead south over the Col de Sidi Marouf to Gounod, and south-east to Ain Beida.

GUEYDON, PORT (AZEFFOUN), *see* p. 165.

GUYOTVILLE. Population 6,736 (2,644 Europeans). Altitude 69 feet.

Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 110/190). Drainage. Hotel. Garages (5).

Guyotville is about $9\frac{1}{2}$ miles west of Algiers and $1\frac{1}{2}$ miles east of Ras Acrata. The town is well laid out, and a popular summer seaside

resort with many villas and a casino built close to the beach. Behind the land rises gently for just over a mile to a height of 395 feet, and then descends fairly steeply to the valley of the Oued Beni Messous, which flows parallel to the coast from Ras Acrata to Pointe Pescade and enters the sea $1\frac{1}{2}$ miles south of Ras Acrata. The sandy soil around Guyotville is extensively cultivated and very productive: vegetables, fruits, and vines (especially the Chasselas variety of table grape) are grown. The European colonists use Kabylie labour. There is a daily market. The water-supply is from springs.

The town was founded in 1844 after the French occupation and called Ain Benien. Later it was renamed Guyotville after Comte Guyot, Minister of the Interior from 1840 to 1846. There are several remains of historical interest in the district, including a prehistoric grotto and several dolmens.

Communications

Rail: Guyotville was served by the tramway which ran parallel with the road from Algiers to Castiglione and Koléa, but this is no longer used and has been partially dismantled.

Road: Besides the Route Nationale from Algiers to Oran along the coast there is a secondary road leading south-east from Guyotville to Chéraga and so to Algiers. There are numerous other small roads of local importance.

HAMMAM BOU HADJAR. Population, urban 5,263 (2,785 Europeans); commune 10,517 (3,078 Europeans). Altitude 505 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 110/210). Hospital. Fire brigade. Hotels (6). Garages (5).

Hammam bou Hadjar is 28 miles south-west of Oran and nearly 7 miles east of Rio Salado. It lies 7 miles south of the Sebkhah d'Oran in the Mléta plain, which stretches along the northern edge of the Monts du Tessala. The Oued Melah or Rio Salado is 2 miles west of the town. A fairly steep hill lies immediately south of Hammam bou Hadjar, from which issue numerous springs. Many of them gush from the ground at a temperature of 165° F. The most important has a flow of 18 gallons a minute. These springs, which were known to the Romans, are used by the natives. The European thermal station is in a park outside the south-western end of the town. Vineyards surround the town. A market is held on Mondays.

Communications

Rail: Hammam bou Hadjar is joined to Oran by a light railway which runs alongside the road crossing the southern edge of the Mléta plain to join the Oran–Ste. Barbe du Tlélat road near the eastern end of the Sebkha d'Oran.

Road: There are secondary roads north-west to Er Rahel, west to Rio Salado, south-west to Ain Témouchent, south-east to Sidi bel Abbès, and east to the Oran–Ste. Barbe du Tlélat Route Nationale.

HERBILLON (TAKOUCH, MERSA TUKUSH), *see* p. 183.

HONAIN, *see* p. 121.

IN SALAH. Population *c.* 5,000 (17 Europeans). Altitude 902 feet.

Chief town of an annexe of the Territoire des Oasis Sahariennes.

Infirmary. Meteorological station. Wireless. Hotel. Garage.

In Salah is 260 miles south of el Goléa in the Tidikelt and is one of a series of oases strung out along a line oriented east-north-east to west-south-west at the southern end of the Tademait plateau. The settlement, which includes four ksour, one of which, the Ksar el Arab, has an entirely black population, is surrounded by palm-groves. The houses of In Salah, including public buildings such as the post office and Officers' Club, are built of red or violet clay in a very individual style. The market is visited by Touareg from the French Sudan as well as from Algeria, but In Salah is less important than it was in the exchange of tea, sugar, cloth, and hardware from the north for the gold dust, ivory, ostrich feathers, and slaves of the south. West of the town there are two sebkhas, one of which gives the impression of being a fair-sized lake in winter. The palm-groves and gardens, which are irrigated by artesian wells and many lines of foggaras (Vol. I, Fig. 22; Photo. 33), are protected against encroaching sand from the east.

Communications

Road: The Ahaggar route from Laghouat, Ghardaia, and el Goléa passes through In Salah and continues south through In Guezzam and Tamanrasset to Zinder and Kano in northern Nigeria. Tracks run south-west to Aoulef and Reggan on the Tanezrouft route. About 80 miles south of In Salah there is a branch south-east to Amguid on the Ajers route.

JEMMAPES. Population, urban 3,438 (757 Europeans); commune 6,636 (921 Europeans). Altitude 297 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Hospital. Hotels (3). Garage.

Jemmapes is 15 miles south-east of Philippeville and stands on a small rise between the main valley of the Oued el Fendek, which is just over half a mile west of the town, and the Oued el Amfèche, which joins the Fendek $4\frac{1}{2}$ miles north-east of Jemmapes. The town lies in a hollow surrounded by wooded hills ranging from 500 to 1,155 feet in height, the nearest of which, Djebel el Oust ($1\frac{1}{2}$ miles north-east of Jemmapes), is isolated by the Oued el Fendek and the Oued el Amfèche. Jemmapes is the centre of a stock-raising and vine-growing district. A market is held on Mondays. Water is supplied from springs.

Communications

Rail: The narrow-gauge line from Bône to St. Charles, the junction on the Philippeville–Constantine line, passes through Jemmapes. The station is east of the town.

Road: Two Routes Nationales from Philippeville pass through the town on the way to Bône: one passes directly through Valée and the other through St. Charles. About 7 miles east of Jemmapes a secondary road branches south-east from the Bône road to Guelma. Other roads of local importance lead north-west, and north-east towards small villages near the coast.

JIJELLI (DJIDJELLI), *see* p. 172.

KELAH, PORT, *see* p. 118.

KHENCHELA. Population 6,149 (1,008 Europeans). Altitude 3,938 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (D.C., 220). Hospital (military). Hotels (5). Garage.

Khenchela lies at the north-eastern end of the Aurès mountains, nearly 30 miles south-south-west of Ain Beida. It occupies an important strategic position at the entrance of the gap between the Aurès mountains and the Monts des Nemencha. About a mile west of the town is the Oued Barhaa, which flows north for 12 miles across a monotonous and marshy plain crossed by oueds to the Garaet et

Tarf. To the north-east is Djebel Tafrent, and south-west lies the extreme tip of the Aurès mountains, which is wooded and rises to heights of between 3,960 and 4,290 feet. The market is held on Tuesdays and Wednesdays.

Khenchela is built on the site of the ancient Mascula, one of the great Roman cities, including Lambessa and Timgad, built along the northern face of the Aurès (Vol. I, pp. 255–258). There are many other Roman remains in the district, notably at Baghai, 6 miles to the north near Auguste Comte.

Communications

Rail: Khenchela is the terminus of the narrow-gauge line from Ouled Rahmoun, on the Algiers–Constantine main line.

Road: The main road from Guelma and Ain Beida to Khenchela continues as a narrow road either south to Khanga in the Monts des Nemencha or south-east to Chéria. A good secondary road runs west to Batna, passing near the ruins of the Roman city of Timgad.

KOLÉA. Population 9,835 (2,221 Europeans). Altitude 429 feet.

Chief town of a commune de plein exercice. Electricity (3-phase, 110/190). Drainage. Hospital (military). Hotels (3). Garages (3).

Koléa is about 17 miles south-west of Algiers and 3 miles from the sea on the southern slopes of the hills of the Sahel, overlooking the valley of the Oued Mazafran and the Mitidja plain. Northward, over the crest of the ridge, the ground falls gently to the sea, but southward the slopes towards the Mitidja are steeper. The town is surrounded by vineyards and orchards and has an abundant supply of water from streams and springs. Koléa was destroyed by an earthquake in 1825, and later was entirely rebuilt with straight streets bordered by trees and European houses. The ancient mosque of Sidi Embarek has been converted into a hospital, but the koubba alongside, regarded by many Arabs as the Mecca of Algeria, has been respected. On a height at the southern end of the town are the barracks and the Jardin des Zouaves. Native workshops produce embroidery and fine Algerian lace. A native market is held on Fridays, and an ordinary market daily.

Koléa was founded in 1550 by Khair ed Din and was at first peopled by Andalusian Moors. In the seventeenth century it became a centre of pilgrimage for Moslems, who came to worship at the tomb of Sidi Embarek. One of Sidi Embarek's descendants, Ben Allal ben

Embarek, rallied to the French but then went over to Abd el Kader. Koléa was attacked by the French for the first time in 1832, and definitely secured in 1843 after the death of Ben Allal ben Embarek at the battle of el Malah.

Communications

Rail: The tramway from Algiers to Castiglione had a branch at Mazafran to Koléa, but the track has now been partly dismantled.

Road: Koléa is joined to the Algiers–Oran coast road near the village of Fouka; other roads lead north-east to Douaouda, north-west to Castiglione, south-west to Marengo, and south-east across the Mitidja to Oued el Alleug and Blida.

LA CALLE (PORT DE LA CALLE), *see* p. 189.

LAGHOUAT (Vol. I, Photo. 12). Population 9,430 (873 Europeans, excluding the garrison). Altitude 2,461 feet. Chief town of the Territoire de Ghardaia, a commune indigène, and an annexe. Electricity (3-phase, 115/200). Drainage. Hospital (military). Meteorological station. Wireless. Hotels (7). Garages (4).

The town of Laghouat is in the extreme south-west of the Monts des Ouled Nail, 65 miles south-south-west of Djelfa, and is the main oasis on the edge of the Sahara between Figuig and Biskra. It stands on the west bank of the Oued Mzi, which is the upper course of the Oued Djedi. The town is built in the form of two amphitheatres on two hills, which are offshoots of Djebel Tizigarine, a small mountain south of the town. About 2 miles north of Laghouat the Oued Mzi makes a right-angled bend west round a line of ridges stretching to the south-west, known as Djebel Ahmar (2,646 ft.) and Djebel Kreneg (2,712 ft.). Laghouat is enclosed by walls and defended by forts which crown the summits of the two hills. The European quarter on the north-western slopes of the southern hill has been built in the French style with straight streets. European houses have replaced most of those of the native style. Place Randan, the central square in this quarter, is surrounded by civil and military buildings, including the Officers' Club, the post office, and the Governor's residence. The native quarter is on the south-eastern slopes of the northern hill and retains its original picturesque streets. The oasis, which covers an area of 625 acres, is divided by the town into two parts, the north-western part being larger than the south-eastern. Three dams, two built by the natives and one by the French, conserve the

waters from the Oued Mzi and are used to irrigate the gardens: the canal which carries the water is known as the Oued Lekhier. There are about 30,000 date-palms, underneath which fruit trees are grown with vines and vegetables, and, on the outer edge of the oasis, cereals. There is a daily market, but the most important is held on Fridays.

Laghouat was probably founded after the Hilalian invasion in the eleventh century. At one time it belonged to Morocco, and later paid tribute very irregularly to the Turks in Algiers. It submitted without a fight to the French under General Marey-Monge in 1844, but a few years later the inhabitants rebelled. In November 1852, therefore, an expedition was organized under General Pélissier, and the town was taken after heavy fighting. Until the French occupation Laghouat consisted of two distinct towns, inhabited by different peoples, the Ouled Serrine and the Hallaf, who were constantly at war with one another.

Communications

Road: Laghouat is the connecting link between the southern parts of the departments of Oran and Constantine, and the focus for routes from the Mزاب and Ouargla in the south, Biskra and the Ziban in the east, and the Ouled Sidi Cheik in the west. The Route Nationale from Algiers, through Blida, Boghari, and Djelfa to Laghouat continues as a secondary road to Ghardaia and the Sahara. Another Route Nationale leads north-west to Aflou and Tiaret.

LALLA MAGHNIA, *see* Marnia (p. 85).

LES FALAISES, *see* p. 172.

LOURMEL. Population, urban 6,966 (2,093 Europeans); commune 9,891 (2,595 Europeans). Altitude 303 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Fire brigade. Hotels (2). Garages (2).

Lourmel is 25 miles south-west of Oran on the north shore of the Sebkhah d'Oran and at the western end. It is surrounded by extensive vineyards, and sheltered on the north by scrub-covered hills which rise from 890 to 1,050 feet. These hills are furrowed by oueds which are dry for most of the year, but water is derived from some wells along their courses, and a canal feeds a reservoir, which supplies Lourmel with some water, the other source being springs. The town

is well laid out on a rectilinear plan. The market is held on Mondays. The manufacture of vegetable fibre is an important industry.

Communications

Rail: Lourmel is on the normal-gauge line from Oran which follows the northern shore of the Sebkha d'Oran to Ain Témouchent. The station is about 300 yards south of the town.

Road: The Route Nationale from Oran to Ain Témouchent follows the railway fairly closely along the edge of the Sebkha d'Oran, but passes through the centre of Lourmel. There are three roads to the coast—north-west to Bou Zedjar, north to a point to the east of Cap Blanc, and north-east to les Andalouses.

MARENGO. Population, urban 5,899 (2,579 Europeans); commune 11,212 (3,147 Europeans). Altitude 297 feet. Chief town of a commune de plein exercice. Electricity (3-phase, 110/190). Hospitals (2). Fire brigade. Hotels (2). Garages (8).

Marengo, 45 miles west-south-west of Algiers and 22 miles west of Blida, lies at the western edge of the Mitidja in the angle formed by the hills of the Sahel in the north and the foothills of the Massif de Miliana and Djebel Zaccar in the south. It is on the right bank of the Oued Meurad, which enters the sea as the Oued Nador $1\frac{1}{2}$ miles west of Tipaza. The region around Marengo is very fertile, with vineyards stretching out on all sides, and the lower slopes of the mountains are wooded. The district is watered by a dam on the Oued Djabroun (about $4\frac{1}{2}$ miles south of the town), which retains a lake 140 yards wide containing about 158 million gallons of water. There is a supply of 44 gallons per second. The town is rectangular in shape with straight streets cutting at right angles. An important market is held on Tuesdays and is attended by thousands of natives, including Kabylies.

Communications

Rail: Marengo is on a branch-line of the Algiers-Oran normal-gauge line from el Affroun. A narrow-gauge line connecting it with the port of Cherchel was closed in 1937. The station is on the east side of the town.

Road: Marengo is on the Route Nationale from Bourkika to Desaix linking the main inland road from Oran to Algiers via Blida with the Oran-Algiers coast road. A main road runs eastward from Marengo along the northern edge of the Mitidja to Koléa and Algiers.

MARNIA (LALLA MAGHNIA). Population 6,704 (2,327 Europeans). Altitude 1,197 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (3-phase, 120/210). Hospitals (1 civil, 1 military). Fire brigade. Bureau arabe. Hotel. Garage.

Marnia is 22 miles west of Tlemcen and about 8 miles from the Moroccan boundary. It stands on the left, or north, bank of the Oued Ouerdefou, a tributary of the Oued Mouilah, which is joined by another stream, the Oued el Aounia, opposite the town. South and west of the town is the plain of Marnia, which extends from the plain of Angad in Morocco on the west to the plain around Hennaya in the east. The plain is well watered by these and other streams, and by canals, wells, and springs; cattle are raised, and cereals and vines extensively grown. North and east are the hills and spurs of the western chains which are from 1,150 to 1,820 feet high; they are cut by many oueds, and are wooded in places, especially to the east of Marnia. The town is well laid out with wide streets intersecting at right angles. There is a market every day, but the most important is held on Sundays, when cattle, horses, wool, wine, and cereals are sold: it is attended by many natives from across the Moroccan border. Water is supplied from springs.

Marnia occupies the site of the Roman town of Numerus Syrorum. The name Lalla Maghnia is taken from a local saint who was famous for her beauty, knowledge, and piety. In 1844 French troops constructed a redoubt, around which camp followers and natives settled, and by 1861 there were 132 European civilians and 415 natives. Until 1907, when eastern Morocco was occupied, Marnia owed its importance to its sheep market where animals from the High Plateaux of eastern Morocco and western Algeria were assembled, but the region has now become an agricultural area.

Communications

Rail: The normal-gauge line from Fes, Guercif, and Oudjda in Morocco passes through Marnia and continues east to Tlemcen, Sidi bel Abbès, and Oran. The station is south of the town on the opposite side of the river.

Road: Marnia stands at the cross-roads of the Route Nationale from Oudjda to Tlemcen and Sidi bel Abbès and the secondary road from Nemours and Nedroma to el Aricha; another road leads south-east up the Tafna valley to Sebdu.

MASCARA (Fig. 17). Population 33,522 (15,118 Europeans). Altitude 1,980 feet. Chief town of an arrondissement, a commune de plein exercice, a commune mixte, and a military subdivision. Compagnie de gendarmerie. Court of First Instance. Electricity (3-phase, 120/210; 3-phase, 115/200). Drainage. Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (9). Garages (7).

Mascara is 50 miles south-east of Oran, and lies on the southern slopes of the Monts des Beni Chougran (between 2,000 and 3,000 feet high) which are known to the natives as Chareb er Rih or 'lip of the wind'. To the south is the great fertile plain of Eghris, where cereals, tobacco, olives, and vines are grown. The town is built on two small hills on either side of the ravine of the Oued Toudmane, which is crossed by three stone bridges; the narrow valley has been converted into a public garden, the Jardin Pasteur.

The eastern quarter, or European town, lies within imposing walls erected during the Second Empire; these are over 2 miles in circuit and are strengthened by bastions and towers. This quarter now spreads across to the old military quarter on the other side of the oued, and also outside the walls. Its centre is the Place Gambetta, which is surrounded by the Town Hall, the town library, the theatre, and the barracks; to the south there is a secondary square, the Place Eugène-Étienne, containing the Great Mosque and the church. From these two squares the two principal arteries lead across the town, the Rue de Mostaganem towards the north-east and the Rue de Tiaret to the east. Mascara is a town of the French colonial type: few vestiges of the Moorish period remain, except for the mosque of Ain Beida (now a granary), where Abd el Kader preached the holy war, and the residence of the beys (now a barracks). On the western side of the Oued Toudmane is the Argoub Ismail suburb, which contains little of interest except the arsenal and barracks. To the north-west outside the walls is the native quarter known as Bab Ali, bounded on the southern side by the Oued bou Sekrine. Carpets and the black burnous known as *khidous* are made here in native workshops, but the principal industry of Mascara is the making of wine. The surrounding vineyards cover an area of between 7,500 and 10,000 acres, and Mascara white wines are held in high repute. Oil and grain are also produced. There are important markets on Thursdays and Fridays. The water-supply is from springs.

Old Mascara, about 2 miles from the present town, was the capital of a Turkish beylik during the Spanish occupation of Oran from 1701 to 1791. After the latter date it declined in importance, and was an



FIG. 17. *Mascara*

insignificant place when Abd el Kader made it the seat of his government in 1822. Marshal Clauzel burned the town in 1835. Abd el Kader returned in 1837, and for four years the struggle continued. It was finally captured in 1841 by Marshal Bugeaud and General Lamoricière.

Communications

Rail: Mascara stands on a branch-line from Tizi on the narrow-gauge line from Oran to Colomb Béchar via Perrégaux. The station is south-west of the town.

Road: Mascara is a very important road-centre at the junction of Routes Nationales leading north-west to Oran, west to Sidi bel Abbès, south to le Kreider, south-east to Frenda and Tiaret, and north-east to Relizane.

MÉDÉA. Population 18,393 (2,717 Europeans). Altitude 3,018 feet.

Chief town of an arrondissement, a commune de plein exercice, and a military subdivision. Brigade de gendarmerie. Electricity (3-phase, 110/190). Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (4). Garages (4).

Médéa is 40 miles south-west of Algiers and 19 miles south of Blida. It stands on a plateau in the hill region forming the watershed between the tributaries of the Oueds Chiffa, Isser, and Chélif. To the north-west is the long ridge of Djebel Nador, the highest peak (3,693 ft.) being $2\frac{1}{2}$ miles from Médéa: its southern slopes fall gently to Médéa and the neighbouring town of Lodi, but the northern face is precipitous. South of the town the plateau slopes fall fairly steeply to the valley of the Oued Snouber. The surrounding country is very fertile, and cereals, olives, chestnuts, and fruit trees flourish. Vineyards cover all the hill-sides around the town.

Médéa is French in character and all the houses have tiled roofs. The Place de la République, in the highest part of the town, is planted with trees and gardens. South-west of it is the Place d'Armes, formerly the heart of the European town, but now used almost exclusively by the native population. The principal public buildings are the hospital, a mosque now used as a Roman Catholic church, and the barracks: the public gardens and nursery to the north-east of the town are well supplied with water from Djebel Nador. The town has an important trade in wines, wool, and cattle, and there are several native crafts, including the manufacture of carpets and cloths, saddles, and embossed leatherwork: there is a small brickworks. The Arab market is held on Thursdays and Fridays. The water-supply is from springs.

Médéa was formerly known as Lambdia and is built on the site of the Roman town of Ad Medias. It rose from obscurity in the tenth century, and during the Turkish occupation was the capital of the

beylik of Titteri. Abd el Kader occupied Médéa in 1835, ousting the beys installed by Marshal Clauzel in 1830. In 1840, after the battle of Mouzaia, the town submitted to the Duc d'Aumale.

Communications

Rail: The narrow-gauge line from Blida to Boghari and Djelfa passes through Médéa.

Road: Médéa is at the junction of the Route Nationale from Algiers to Laghouat with that west to Affreville. There are local roads to the villages in the surrounding mountains.

MÉNERVILLE. Population, urban 2,656 (1,929 Europeans); commune 12,755 (2,640 Europeans). Altitude 660 feet. Chief town of a commune de plein exercice. Electricity (3-phase, 110/190). Hospital. Fire brigade. Hotels (3). Garages (2).

Ménerville is 28 miles east of Algiers and $5\frac{1}{2}$ miles south of the coast at Port aux Poules. It stands on the steep-sided Col des Beni Aichaa, which is only 850 yards wide in its narrowest part, and marks the division between the Mitidja and the Grande Kabylie. Between Ménerville and the coast the scrub-covered Djebel bou Arous rises steeply to a height of 1,399 feet, and then falls more gently to the coast. South and east is the valley of the Oued Isser, the sides of which rise to over 1,800 feet and are deeply incised by streams: in many places the hill-slopes are covered with vineyards and olive-groves. A market is held on Tuesdays. The town is supplied with water from springs.

Communications

Rail: Ménerville is the junction of the normal-gauge line to Tizi Ouzou with the main line from Algiers to Constantine. South of the town the latter line follows the Isser valley to Palestro and Bouira.

Road: The Route Nationale from Algiers to Constantine passes through Ménerville, and just east of the town another Route Nationale branches east across the Grande Kabylie to Tizi Ouzou and Bougie.

MERSA TUKUSH (HERBILLON, TAKOUCH), *see* p. 183.

MERS EL KEBIR, *see* p. 123.

MILIANA. Population 13,521 (3,206 Europeans). Altitude 2,428 feet. Chief town of an arrondissement and a commune de plein exercice.

Electricity (3-phase, 115/200). Drainage. Hospitals (1 civil, 1 military). Meteorological station. Hotels (5). Garages (5).

Miliana is about midway between Blida and Orléansville and $3\frac{1}{2}$ miles north of Affreville. It stands on the flank of Djebel Zaccar Gharbi, which rises to 5,210 feet directly to the north, and is wooded in many places, and snow-covered in winter. The town occupies a magnificent position commanding the Chélif valley on the east and south, and the plateau running along the edge of the Zaccar mountains on the west: orchards, vineyards, and luxuriant gardens stretch below. Miliana is fortified, the walls being built on the foundations of Berber and Turkish works: there are two gates, the Zaccar gate to the north-east and the Chélif gate to the west. The streets are shaded by plane trees and have running water on both sides. The centre of the town is the Place Carnot or Place de l'Horloge, where an old minaret has been converted into a clock-tower. In the southern part of the town are the schools, hotels, and various public buildings; such Arab buildings as remain are in the north-west, where also is the mosque of Sidi Ahmed ben Youssef in the Moorish style; it is visited twice a year by pilgrims from Algeria and Morocco. Miliana is an unusually clean town and receives pure and clear water from the Zaccar mountains, amounting to 120,000 gallons per hour; the flow is harnessed to provide electricity to light the town and to provide power for the flour-mills and the tile and other factories. A mile west-north-west of the town is the Oued Rehane iron-ore mine which is no longer productive (p. 239). The market is held on Sundays, Tuesdays, and Fridays.

Miliana is built on the site of the Roman town of Zuccubar, which had a Christian church and bishop in A.D. 411. The present town was probably founded in the tenth century, at the same time as Algiers and Médéa, by Bulukkin ibn Ziri. In 1834 Abd el Kader installed a caliph. In 1840 French troops entered the town, which had been set on fire by the natives before they evacuated it, but had great difficulty in maintaining communications with Algiers until 1842, when Abd el Kader withdrew from the neighbourhood.

Communications

Road: Miliana is on the Route Nationale from Oran to Algiers just north of Affreville where the road climbs steeply over the southern slopes of Djebel Zaccar. Secondary roads of local importance run north-west to Levacher and north over the Col des Rirhas to Ain Sour, a popular summer resort.

MOSTAGANEM (MOSTAGHANEM), *see* p. 138.

NEDROMA. Population 6,698 (791 Europeans). Altitude 1,378 feet. Chief town of a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Hospital. Hotels (2). Garages (1).

Nedroma is in the Massif des Traras, 16 miles north of Marnia and about 13 miles south of the port of Nemours. It stands at the foot of the massif of Djebel Fillaoussene, the highest peak of which (3,749 ft.) is just over 3 miles east of the town. Numerous tributaries of the Oued et Tlata drain from the mountain, and one of them, the Oued Zaifa, passes west of the town and supplies it with water. Northward the fertile and cultivated plain of Mezaourou stretches towards the coast. Nedroma was surrounded by old walls with crenellated towers, parts of which remain. There are ten mosques, the oldest, Sidi bou Ali, dating from A.D. 1082, according to an inscription, and the minaret of the Great Mosque from 1348. The town is surrounded by gardens, orchards, and olive groves. Markets are held on Mondays and Thursdays. Local manufactures include carpets, haiks and burnous (Vol. I, p. 221), Berber pottery, embroidery on tulle, lace, and vegetable fibre. There are small zinc mines and marble quarries to the south of the town.

The date of origin of Nedroma is uncertain. The Almohad dynasty came from the surrounding country as the founder, Abd el Moumen, belonged to the Berber tribe which occupied the region. Nedroma probably replaced the older Berber town of Felloucén. It is mentioned for the first time in the eleventh century, and generally seems to have followed the fortunes of Tlemcen. It was occupied by General Bedeau in 1842.

Communications

Rail: The normal-gauge line from Oudjda to Nemours passes through Nedroma.

Road: Nedroma lies at the foot of Bab Taza, on the second-class road from Marnia to Nemours. Another road leads east to the Tafna valley, and then south-east to Eugène-Étienne and Tlemcen. A third-class road goes due north to reach the coast near Pointe Lella Selti (Lalla Setti) or Rastrella Selti.

NEMOURS, *see* p. 118.

ORAN, *see* p. 127.

ORLÉANSVILLE (Photo. 11). Population, urban 5,222 (3,200 Europeans); commune 22,575 (4,327 Europeans). Altitude 462 feet. Chief town of an arrondissement and a commune de plein exercice. Brigade de gendarmerie. Court of First Instance. Electricity (3-phase, 115/200). Gas. Drainage. Hospitals (1 civil, 1 military). Meteorological station. Hotels (6). Garages (6).

Orléansville is about midway between Algiers and Oran, on the left bank of the Oued Chélif. The town lies in a valley little over 2 miles wide, between the Dahra massif to the north and the Ouarsenis massif to the south. Its climate is extreme and difficult for Europeans (for climatic figures, *see* Vol. I, Appendix B), and eucalyptus and pine trees have been planted to provide shade. A dam built above Lamartine near the junction of the Chélif and the Oued Fodda, about 11 miles to the east of the town, supplies 45,000 acres with water for cereal cultivation and experiments in cotton growing in the surrounding district (p. 203; Photo. 40).

The town is still surrounded by a wall pierced by eight gates, although these are falling into disrepair. To the west it is bounded by the Oued Tiraout, a tributary of the Chélif. Three principal avenues, oriented from east-north-east to west-south-west, run the length of the town, the Rue du Docteur Bouteloup and the Rue d'Isly (with the Place Paul Robert, the centre of the town, between them), and the Avenue Carnot. To the south of a parallel street, the Boulevard du Sud, is the native quarter. There are several ancient remains, including the Basilica of St. Reparatus, with its mosaic floor, built by the emperor Constantine. The public buildings include the Town Hall, Law Courts, theatre, barracks for 3,000 men, and a mosque built at the beginning of this century. There is a covered market, and outside the walls an important market is held on Saturdays and attended by many natives of the Dahra and the Ouarsenis. On the opposite side of the Chélif, round the suburbs of la Ferme, are great irrigated gardens and orchards.

Orléansville was built on the site of the Roman settlement of Castellum Tingitanum, of which several ruins remain, including the basilica. The present town was founded in 1843 by Marshal Bugeaud.

Communications

Rail: Orléansville is on the normal-gauge line from Algiers to Oran. The station is south of the town. The narrow-gauge line to the port of Ténès is no longer used.

Road: The town is at the cross-roads of the Routes Nationales from Algiers to Oran and from Ténès to Vialar. There are secondary roads north-east to Flatters and west to Mazouna.

OUARGLA. Population 6,449 (474 Europeans). Altitude 425 feet. Chief town of the Territoire des Oasis Sahariennes, a commune indigène, and an annexe. Hospital (military). Infirmary. Wireless. Hotels (2).

Ouargla is about 200 miles south of Biskra on one of the trans-Saharan routes from northern Algeria to the Niger valley. The oasis lies in an enclosed basin bordered by a belt of sebkhas and invaded by sand in many places. The general uniformity of the basin is relieved by isolated, steep-sided, and flat-topped hills, known as *gour* (sing. *gara*) (cf. Vol. I, p. 69 and Photo. 20). The town itself lies between two arms of the Sebkhâ Oum er Raneb. It is a walled town, divided into three separate quarters—Beni Sissine, Beni Ouaggine, and Beni Brahim—and entered by six gateways, which are fortified. The majority of the population is of mixed Berber and negro blood. The French fort, Bordj Lutaud, which includes the administrative and military buildings, the hospital, and the schools, is south of the native town. Ouargla obtains its water-supply from the subterranean course of the Oued Mya by means of wells, about 100 feet deep. There are nearly a thousand wells in the oasis, though many of them, built by the natives, are unsatisfactory. Europeans have built better and more reliable wells, and tapped new supplies of water in recent years. There is a daily market for sheep, camels, goats, dates, cereals, wool, and cotton.

Ouargla claims to be the oldest town in the Sahara. In the tenth century the surrounding country was the first place at which Berber heretics settled after the Ibadite exodus. The ruins of their towns are still visible, the most famous being at Cedrata to the south-west of Ouargla. The town of Ouargla was built after the departure of the Mozabites to the Mzab (p. 75). For a long time it was self-governing, but eventually placed itself under the protection of the Sultan of Morocco, who had, however, ceased to have any power in the town long before the French occupation. In 1853 Sidi Hamza, of the Ouled Sidi Cheikh, occupied Ouargla in the French name, but not until 1872 was French authority definitely established. Subsequently the Mozabites have returned to trade, and have also acquired property from the negroes, who are now their tenants. The importance of

Ouargla as a trans-Saharan trade centre has declined since the suppression of the slave trade.

Communications

Road: The most important roads are those to Touggourt in the north-east, Ghardaia in the north-west, and el Goléa and Timimoun in the south-west. There are motorable tracks north-west to Guerrara and south-east to Fort Lallemand and Fort Flatters. The Ajjers route across the Sahara passes through Ouargla.

OUED, EL (Photo. 15). Population 11,936 (32 Europeans). Altitude 313 feet. Chief town of a commune mixte and an annexe. Meteorological station. Hotels (2). Garage.

El Oued, the chief town of the Souf oases, is 137 miles south-east of Biskra, 50 miles west of the Tunisian boundary, and 62 miles east of Touggourt. It stands almost midway in a line of oases stretching for 25 miles from north-west to south-east. The oasis is surrounded by sand-dunes of the eastern (Igharghar) Erg. The native population of el Oued is mainly composed of two different tribes, the sedentary Achèche and the nomadic Msaaba. The houses are cubes made of a gypseous clay-stone, which serves both as stone and mortar. The cubes are crowned by domes. Local industries include the making of carpets, burnous, and haiks, which are sold at the market held on Fridays.

Communications

Road: Good roads lead north-west to Biskra, north-east to Nefta and Tozeur in Tunisia, and south-west to Touggourt.

PERRÉGAUX. Population, urban 8,699 (6,289 Europeans); commune 20,611 (8,383 Europeans). Altitude 141 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Hotels (4). Garages (5).

Perrégaux is a modern town, founded in 1858 by General Perrégaux, 24 miles south-west of Mostaganem, and about 30 miles south-east of Arzeu. It stands on the right bank of the Oued el Hammam as the river leaves the Monts des Beni Chougran. On the north a level plain stretches towards the coast, from which it is separated by a chain of low hills; southward, immediately behind the town, the hills rise to heights of between 600 and 1,000 feet. The town is well laid out with straight streets and squares planted with trees. It receives its water

from springs, and is the centre of a rich agricultural region producing oranges and other fruits, olives, vegetables, and cereals. An important market is held on Wednesdays. The district is irrigated by the water of the Oued el Hammam. Formerly the barrage was about 6 miles upstream from Perrégaux, just below the confluence of three streams, the Oued Habra, the Oued Fergoug, and the Oued Terzoug, but in 1872, 1881, and 1927 the dam gave way, causing considerable loss of life. It has now been replaced by the Barrage de Bou Hanifia, which is farther upstream and irrigates 75,000 acres of land (p. 203; Photo. 39). An experimental station for cotton cultivation has been established. Half a mile south of Perrégaux is a negro village.

Communications

Rail: Perrégaux is an important railway junction with two stations. One is on the normal-gauge line from Algiers and Orléansville to Oran, and the other is on the narrow-gauge line from Arzeu to Saida, Ain Sefra, Colomb Béchar, and Kenadza.

Road: Perrégaux is on the Route Nationale from Oran to Algiers, and there is a good road north to the port of Mostaganem. A narrow secondary road runs south to Dublineau on the Oran-Mascara road.

PHILIPPEVILLE, *see* p. 177.

PORT AUX POULES, *see* p. 138.

PORT BREIRA, *see* p. 145.

PORT DE LA CALLE (LA CALLE), *see* p. 189.

PORT GUEYDON (AZEFFOUN), *see* p. 165.

PORT KELAH, *see* p. 118.

PORT SAY (ADJEROUD), *see* p. 117.

POULES, PORT AUX, *see* p. 138.

RELIZANE. Population 16,496 (4,558 Europeans). Altitude 330 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Gas. Hospital. Meteorological station. Hotels (6). Garages (6).

Relizane is about midway between Oran and Orléansville and 32 miles south-east of Mostaganem. The town lies $1\frac{1}{2}$ miles east of

the Oued Mina, which divides the Ouarsenis massif from the Monts des Beni Chougran and is one of the more important left-bank tributaries of the Chélif. In spite of the excessive heat of summer, and the impregnation of the land with salt, the town is surrounded by gardens and orchards which are irrigated by the Bakhadda dam, nearly 2 miles to the south-west; this waters 30,000 acres of land (p. 203). Excellent cereal crops and high-class vines are produced, and an important market for cattle, horses, mules, wool, and cereals is held every Thursday. Relizane is built on the ruins of the Roman city Mina and is a typical French town with wide streets. The native quarter lies to the south of the town, and the Moslems and Jews each have their separate streets, shops, and baths. There are large co-operative warehouses and jam and biscuit factories. Kalaa carpets, made at Kalaa des Beni Rached, 12 miles south-west of Relizane, are sold in the market, held on Thursdays. The town is supplied with water from springs. The Medjilla petroleum boring is about 4 miles south of Relizane (p. 251).

Communications

Rail: Relizane is an important railway junction. It is on the main line from Oran to Algiers, and there are narrow-gauge lines to Mostaganem and Arzeu on the coast, and south to Prévost-Paradol and Tiaret via Uzès-le-Duc or via Zemmora.

Road: The Oran–Algiers Route Nationale passes through Relizane, where it is joined by the Route Nationale from Mascara, Sidi bel Abbès, and Tlemcen. Mostaganem is connected with Relizane by a Route Nationale and by an alternative secondary road, while another secondary road leads south along the Mina valley to Sidi Mohammed ben Aouda. About 5 miles east of Relizane another Route Nationale branches south-east to Zemmora and Tiaret.

RIO SALADO. Population, urban 6,634 (5,429 Europeans); commune 10,970 (5,782 Europeans). Altitude 280 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Fire brigade. Hotels (3). Garages (4).

Rio Salado is 7 miles north-north-east of Ain Témouchent in the centre of the rich agricultural land which spreads to the west and south-west of the Sebkha d'Oran. It lies $1\frac{1}{2}$ miles west of the Oued el Laham, a tributary of the Rio Salado or Oued Melah. The town is in level country, which is broken only by Djebel Mengel

(877 ft.), a boomerang-shaped, scrub-covered line of hills, 2 miles north-west of Rio Salado, and Djebel el Meida (660 ft.), a ridge 3 miles to the east, beyond the Oued el Laham. Northward, beyond the Rio Salado valley, stretch the coastal hills, a westward extension of the Djebel Murdjadjo range. The town is well laid out, with straight streets at right angles to each other, and is the centre of an important vine- and olive-growing district. A market is held on Sundays. The water-supply is from springs.

Communications

Rail: The normal-gauge line from Oran to Ain Témouchent serves the villages on the northern shore of the Sebkha d'Oran and passes through Rio Salado. The station is half a mile to the north-east of the town, to which it is joined by road.

Road: The Route Nationale from Oran to Ain Témouchent and Tlemcen passes through the centre of the town. Secondary roads lead east to Hammam bou Hadjar and along the southern edge of the Mléta plain and round the eastern end of the Sebkha d'Oran to Oran. A narrow road leads north-west through Turgot to the coast.

SAIDA. Population 14,761 (6,501 Europeans). Altitude 2,789 feet.

Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Drainage. Hospital (military). Meteorological station. Fire brigade. Hotels (5). Garages (11).

Saida is 76 miles south-east of Oran, at the southern edge of the Tell on the borders of the High Plateaux. It stands on the right bank of the Oued Saida. On the opposite side of the river the town is sheltered by a line of wooded mountains forming part of the Monts de Daia and the Monts de Saida, which rise steeply from the valley; the nearest, Djebel Abd el Krim, is 3,966 feet high only 3 miles west of the town. To the east there is undulating country with scrub-covered hills rising about 600 feet above the general level of the country. To the south the ground rises gradually towards the High Plateaux. The surrounding country is fertile and healthy, and there is an abundance of water.

The centre of the town is the Place Raymond Poincaré, from which the principal streets radiate—the Avenue Georges Clemenceau to the north-west, the Avenue Gambetta to the west, the Rue du 4 Septembre to the south, and the Avenue Foch to the east. The public buildings include the Town Hall, Law Courts, and on the eastern side the military establishment, which contains the barracks

and the hospital. The market is held on Mondays, and there is considerable trade in sheep, wool, alfa, and cereals. The principal native craft is leatherwork.

Saida has always been an important military town because of its position at the junction of the Tell and the High Plateaux. The Romans had a fort there, and it was one of the capitals of Abd el Kader, who set fire to it before the arrival of Marshal Bugeaud in 1841. Three years later a strongpoint was built and was the origin of the modern town, from which many expeditions set out in the following twenty-five years. The creation of a civil centre dates from 1862. Its modern growth has been due to its position on the railway from the coast to Colomb Béchar.

Communications

Rail: The Oran-Colomb Béchar narrow-gauge line passes through the town.

Road: The Route Nationale from Mostaganem, Perrégaux, and Mascara passes through Saida and continues south to le Kreider. About $7\frac{1}{2}$ miles south of le Kreider the road forks, the left branch leading to Géryville and the right to Ain Sefra and Colomb Béchar. There are secondary roads north-east to Tagremaret on the Mascara-Tiaret Route Nationale, and north-west to the Mascara-Sidi bel Abbès Route Nationale.

ST. ARNAUD. Population, urban 5,721 (1,063 Europeans); commune 9,300 (1,114 Europeans). Altitude 2,625 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Hotels (3). Garages (2).

St. Arnaud is 15 miles east of Sétif in the plain of the Constantine chotts. It stands on the left bank of the Oued Sarek, which drains into the Sebkret Bazer, $5\frac{1}{2}$ miles south of the town. The town is in a fairly level plain which widens southward into a region of indeterminate drainage, where the various chotts are separated by low hills and swells; north of the town a semicircle of hills rises more or less steeply from the plain to heights of 3,300 to 4,120 feet. Water is supplied by wells. South-west of St. Arnaud is an experimental farm-school for natives. A market is held on Mondays. It is the nearest point to Djemila, the Roman Cuicul.

Communications

Rail: The normal-gauge line from Algiers to Constantine passes through St. Arnaud.

Road: The Route Nationale from Algiers to Constantine passes through the centre of the town. There are secondary roads leading north across the Kabylie des Babors to Chevreul and Djidjelli, north-east to Mila, and south to Ampère and Corneille.

ST. DENIS DU SIG. Population 10,678 (3,841 Europeans, including many Spanish). Altitude 175 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Drainage. Hospital. Fire brigade. Hotels (2). Garages (4).

St. Denis du Sig is about 28 miles south-east of Oran and 14 miles east of Ste. Barbe du Tlélat, on the right bank of the Oued Sig as it leaves the Monts du Tessala, a mile below the confluence of the Oued Sidi Mebtoub and the Oued Matara. To the north of the town the Sig plains stretch for 20 miles to the Golfe d'Arzeu, and about a mile to the south-east Djebel Touakas rises fairly steeply to a height of 1,415 feet. The town is built on a rectilinear plan, with wide streets and squares planted with trees; there is a public garden by the side of the river. The water-supply is from springs and filtered river water. The town is the commercial centre of a rich agricultural region producing wheat, barley, oats, colza, cotton, flax, tobacco, vines, and alfa; it is surrounded by plantations of olive groves, and much olive-oil is exported. The market is held on Sundays. There are several flour-mills and cotton ginning factories. The whole district is irrigated by the Barrage des Cheurfas, which is about $17\frac{1}{2}$ miles higher up the river (p. 203; Photo. 37). It was built in 1882, but three years later it burst and flooded the district. It has since been reconstructed and now irrigates about 17,500 acres of land; the overflow is stored in another dam, the Petit Barrage, about 2 miles south of the town.

Communications

Rail: St. Denis du Sig is on the main line from Oran to Algiers. The station is north of the town.

Road: The Oran-Mascara Route Nationale passes through the town, which is also connected with the port of Arzeu by a secondary road. Another secondary road follows a tributary valley of the Sig south-westward to Bou Djebaa and les Trembles.

SAY, PORT (ADJEROUD), *see* p. 117.

SÉTIF (Photo. 13). Population 36,041 (10,028 Europeans). Altitude 3,596 feet. Chief town of an arrondissement, a commune de plein exercice, and a military subdivision. Compagnie de gendarmerie. Court of First Instance. Electricity (3-phase, 115/200). Drainage. Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (7). Garages (15).

Sétif stands in the centre of the high plains of Sétif, 44 miles south-east of Bougie and $1\frac{1}{2}$ miles east of the Oued bou Sellam. The Kabylie des Babors rise 15 miles to the north; to the south the plains stretch for 10 miles as far as Djebel Youssef. Until 1925 the town remained within its walls, which are roughly diamond-shaped and enclose two quarters, the civil and the military. Since then Sétif has more than doubled its size and has spread particularly to the east around the station and to the north near the native village of Bel Air.

The main artery of the old civil quarter is the Avenue Georges Clemenceau, which extends from the old Algiers gate and the Place Joffre in the west to the old Constantine gate in the east, beyond which it is continued as the Avenue Jean-Jaurès. The Town Hall, the Protestant church, the old mosque, and the synagogue are built around the Place Joffre, and nearby are the theatre and the Prefecture. Outside the Algiers gate in the Jardin d'Orléans is an open-air museum with a collection of Roman remains. South of the main street are the other public buildings, including schools, churches, and the covered market. To the north is the great military quarter on the site of a Byzantine fortress, of which parts of the walls remain. The barracks can hold 3,000 troops: the other military buildings include the hospital, the Officers' Club, and the arsenal. The market is held daily in the southern part of the town, with an important cattle market on Tuesdays, which is sometimes attended by 10,000 natives. The surrounding country is fertile, and many cereals are grown, but the climate is too severe for vines. Stock are bred successfully, especially horses and mules.

About A.D. 96 the Emperor Nerva established a colony of veterans at Sitifis, which became an important town, and was the capital of the province of Mauretania Sitifensis in the third century (Vol. I, p. 255). It was partly destroyed by an earthquake in the fifth century, and later was almost completely laid in ruins by Vandals and Arabs, who left few remains of the city, which originally measured 3 miles in circumference. Sétif was taken by the French in 1839.



13. Sétif from the south-west



14. *Tlemcen from the north*



15. *El Oued*

Communications

Rail: The normal-gauge line from Algiers to Constantine passes through Sétif. The station is in the south of the eastern suburbs.

Road: Sétif stands at the cross-roads of the Routes Nationales from Algiers to Constantine and from Bougie to Biskra. There are secondary roads south-east to Ampère and Batna, north-east to the Constantine-Djidjelli road, and north-west through Ain Roua to the Soummam valley and Bougie.

SHERSHEL (CHERCHEL), *see* p. 147.

SIDI BEL ABBÈS (Fig. 18, Photo. 103). Population 54,754 (33,810 Europeans, including many Spanish). Altitude 1,551 feet. Chief town of an arrondissement and a commune de plein exercice. Brigade de gendarmerie. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 120/210). Gas. Drainage. Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (9). Garages (4).

Sidi bel Abbès is 36 miles south of Oran in the centre of the plain of Bel Abbès, a gently undulating region drained by the Oued Mékerra, between the Monts du Tessala to the north and the Monts de Daia to the south. The Oued Mékerra winds through the northern suburbs of the town, which is a typical French colonial town, with a rectangular plan. Originally it was surrounded by walls and bastions, which were pierced by four gates, but in 1932 the gates and walls were demolished and replaced by wide squares and boulevards, beyond which the suburbs are constantly spreading. In the older part of the town the two main streets are the Boulevard de la République from east to west and the Rue Prudhon from north to south, which cross at the Carrefour des Quatres Horloges: the commercial centre, however, is the Place Carnot. The Rue Prudhon divides the town into two, the civil quarter lying to the east and the military to the west. The line of this street is continued northward across the river to the northern suburbs as the Avenue Émile Loubet. From the eastern end of the Boulevard de la République broad avenues stretch to the north-east and south-east almost at right angles to one another, and roughly the same plan is repeated at the other end of the boulevard. The northern suburbs of Bugeaud and Marceau link the city centre with the station; to the east beyond the old Mascara gate is the district of Eugène-Étienne; in the south near the Daya gate is

the suburb of Négrier; and to the west, separated from the old Tlemcen gate by the public gardens, is the district of Thiers. The military quarter in the old town has barracks with accommodation for 6,000 men, a commissariat, and a hospital. It is the base of the first regiment of the Foreign Legion (p. 20).



FIG. 18. *Sidi bel Abbès*

Sidi bel Abbès is the centre of one of the most fertile and best colonized regions in Algeria. The site of the town, formerly a swamp, has been thoroughly drained, and now is healthy, fertile, and prosperous. Wheat is the principal crop, but barley, tobacco, and olives are also grown, and vineyards surround the town; there is a large trade in alfa. The market for cattle and wool is held on Thursdays. There is good water-supply from the Oued Mékerra and one of its

tributaries. There are several factories making bricks and tiles, shirts, coachwork for cars, slippers and sandals, furniture, cheese, and macaroni and spaghetti.

The town derives its name from the tomb of the marabout, Sidi bel Abbès, near which a strongpoint was built by General Bedeau in 1843 to control the confederation of the Beni Ameur tribes. Two years later natives of the Ouled Brahim tried to seize the town, but were repelled. Sidi bel Abbès became a military centre in 1847 and a civil centre in 1849.

Communications

Rail: Sidi bel Abbès is on the normal-gauge line from Oran and Ste. Barbe du Tlélat to Tlemcen, Oudjda, and Casablanca. At Tabia, 11 miles south of the town, there is a normal-gauge branch-line to Ras el Ma (Crampel). It is also the junction for the narrow-gauge line east to Tizi and Mascara (p. 354).

Road: The Oran–Tlemcen–Oudjda Route Nationale passes through Sidi bel Abbès. Other Routes Nationales lead east to Mascara and south to Bedeau and el Aricha. There are secondary roads north-west to Er Rahel, west to Ain Témouchent, and south-west to Tabia and Sebdou.

SOUK AHRAS. Population 16,064 (5,509 Europeans). Altitude 2,297 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (3-phase, 115/200). Drainage. Hospitals (1 civil, 1 military). Fire brigade. Hotels (5). Garages (2).

Souk Ahras is 44 miles south-south-east of Bône and 22 miles west of the Tunisian border, and stands on an undulating plateau near the south-western end of the Monts de la Medjerda, in which rises the Oued Medjerda, the chief river of Tunisia. It is surrounded by hills rising 500 or 600 feet above the town, and is dominated by Djebel el Arous (3,633 ft.) to the south-west and Djebel bou Bakouch (4,247 ft.) to the north.

The modern town, which dates from the French occupation, is well laid out, the wide streets, planted with trees, converging on the Place de Thagaste in the centre of the town. The southern end of the town contains the commercial buildings, the mosque, the native quarter, and the market, which is held on Tuesdays and Wednesdays. In the northern part are the church, the theatre, the museum, and the Town Hall, with the public gardens in the north-east. Souk Ahras

is surrounded by flourishing vineyards, beyond which are forests. Cattle-rearing is carried on, and much of the phosphates from Tébessa passes through the town. Water is obtained from springs.

Souk Ahras was the Roman colony of Thagaste, where St. Augustine was born in A.D. 354, and to which he returned as a teacher. There are numerous Roman remains in the suburbs of the town, some of the baths still being used by the natives. Before the French occupation the surrounding country was dominated by the Hanencha, an arabized Berber tribe whose territory stretched into Tunisia.

Communications

Rail: Souk Ahras is on the Algiers–Tunis normal-gauge line, at the junction with the normal-gauge electrified line to Oued Kébérît which continues as a narrow-gauge line to Tébessa.

Road: Souk Ahras is on the Route Nationale from Constantine and Bône to Ghardimaou and Tunis, and another Route Nationale runs south to Tébessa. There are good roads north to la Calle, east to le Kef, and south-west to Sédrata.

STORA, *see* p. 176.

TAKOUCH (HERBILLON, MERSA TUKUSH), *see* p. 183.

TÉBESSA. Population, urban 7,770 (2,075 Europeans); commune 12,444 (2,380 Europeans). Altitude 2,789 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (D.C., 220/440). Drainage. Hospital (military). Meteorological station. Fire brigade. Hotels (3). Garages (5).

Tébessa is 55 miles south-east of Ain Beida, 100 miles south-south-east of Bône, and 12 miles west of the Tunisian border. To the north of the town the Plaine de la Merdja stretches for about 5 miles to Djebel ed Dir (4,864 feet). On the southern side the wooded slopes of Djebel Ozmer (part of the Djebel Doukkane ridge) rise to a height of 5,030 feet. Streams from these hills flow past Tébessa to join the Oued el Kebir, one of the tributaries of the Oued Chabro. To the east of Tébessa the level plain is blocked along the Tunisian border by Djebel Kouif and Djebel el Mouhad, a range of low, wooded hills, forming the divide between the Oued Chabro and the Oued Hatab; to the west the plain merges into undulating country with scattered ranges of low hills, interspersed with chotts.

The modern town of Tébessa, which lies in the south-western part of extensive ruins, is within the walls of the Byzantine citadel, and, with the exception of the Kasba, a Roman Catholic church, and a few European houses, is entirely native; the centre is the Place de la Kasba. The Byzantine walls (27 ft. high) are strengthened by thirteen square towers and pierced by four gates, of which the northern is formed by the arch of Caracalla (Vol. I, Photo. 57). The town is supplied with water from a spring by an aqueduct half a mile long. There are numerous ruins of the Roman period: the most outstanding are the arch of Caracalla (A.D. 214), the temple of Minerva (third century), and the citadel of Solomon (one of Justinian's generals), which was built after the destruction of the city in 535. About 500 yards from the modern town is the ruined monastery and church, one of the most interesting Christian monuments of north Africa (Vol. I, p. 258). With the exception of a narrow fringe of gardens around Tébessa the plain is now entirely given over to the cultivation of cereals, which have replaced the olive cultivation of Roman times. The market is held on Tuesdays and Wednesdays; there are several local industries, including the making of native silk embroidery and knotted carpets. Phosphates are found in Djebel ed Dir and Djebel Kouif, though they are mined only in the latter (p. 247).

Tébessa, the ancient Theveste, for a time the military headquarters of Roman Africa, became a civil municipality about A.D. 75. It was made a colony by Trajan, and in the second half of the third century was one of the richest cities of Africa and a road centre of first-class importance (cf. Vol. I, Fig. 46). In the fifth century it was destroyed by the Vandals, but was rebuilt in 535 by Solomon, one of Justinian's generals. After being conquered by Moors, Berbers (597), and Arabs (682), the town sank into oblivion. In the sixteenth century the Turks placed a small garrison of janissaries at Tébessa, but the whole region was really under the control of three tribes of arabized Berbers—the Nemencha, the Harakta, and the Hanencha. After the capture of Constantine by the French in 1837 the Turkish garrison fled into Tunisia. Generals Négrier and Randon made preliminary reconnaissances of the district in 1842 and 1846 respectively, and in 1851 the French took definite possession of Tébessa and installed a garrison.

Communications

Rail: Two narrow-gauge railways converge at Tébessa. One is the line from Oued Kéberit which continues the electrified normal-

gauge line from Bône. The other connects Tébéssa and Constantine, joining the normal-gauge main line at Ouled Rahmoun (south of Constantine) and passing through la Meskiana and Ain Beida. This line is continued to the north-east into Tunisia, to Haidra, Pont du Fahs, and Tunis.

Road: Tébéssa is an important road junction, controlling routes into Tunisia. Two Routes Nationales converge, one from the north from Souk Ahras, the other from the north-west from Ain Beida and Constantine. To the south and east there are a number of secondary roads and tracks into central and southern Tunisia: the most important is the road south-east to Feriana and Gafsa.

TÉNÈS (TENEZ), *see* p. 143.

TENIET EL HAD. Population, urban 2,881 (530 Europeans); commune 5,869 (575 Europeans). Altitude 3,773 feet. Chief town of a commune de plein exercice and a commune mixte. Electricity (3-phase, 115/200). Hospital (military). Meteorological station. Fire brigade. Hotels (2). Garages (2).

Teniet el Had is $36\frac{1}{2}$ miles south-west of Affreville and 40 miles west of Boghari. It lies in the Ouarsenis mountains, commanding the most used col in the range, which gives access from the Tell to the High Plateaux. It is surrounded by mountains between 4,500 and 5,850 feet high. Two ridges converge on the town, Djebel el Meddad (5,897 ft.) from the north-west and Djebel Ghilas (5,350 ft.) from the north-east. They are snow-covered for part of the year and are well forested, and, combined with mineral springs, an abundance of water, and a cool climate in summer, they have made Teniet el Had a popular summer resort. Most of the town is built along an avenue oriented from north to south. A military post, established in 1843 to ensure communications between the Tell and the High Plateaux, lies on a hill to the north-west; the native town is on another hill on the east. A native market for cereals, fruits, and vegetables is held on Sundays at the southern end of the town, near the road leading to Tiaret.

Communications

Road: Teniet el Had is on the Route Nationale from Mascara to Affreville via Tiaret and Vialar. There are secondary roads south to Chellala, east to Boghari, and west to Molière and Orléansville, but these, especially the latter, are difficult mountain routes.

TIARET. Population 23,622 (11,211 Europeans). Altitude 3,871 feet. Chief town of an arrondissement, a commune de plein exercice, and a commune mixte. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Gas. Hospital (military). Meteorological station. Fire brigade. Hotels (3). Garages (6).

Tiaret is 122 miles south-east of Mostaganem and 52 miles south-west of Teniet el Had, at the southern end of the Ouarsenis mountains and on the edge of the High Plateaux. It is the chief centre of the Sersou plateau, a fertile region stretching southward from Tiaret and producing cereals and livestock. The town occupies an important strategic position on a pass; it lies in a col between two ravines on the slopes of Djebel Guezzoul (4,510 ft.), a wooded ridge, the western slopes of which are cut by the Oued Mina. The Oued Tiaret, a tributary of the Oued Mina, flows through the centre of the town in a series of cascades. Water is supplied from springs.

Tiaret is surrounded by a bastioned wall pierced by three gates and has two distinct quarters, the upper or residential quarter with the Place Carnot as its centre, and the lower town, which is grouped round the covered market and is the chief business centre, containing the principal public buildings. To the east is the citadel on a hill overlooking the ravine; to the west, opposite the fort on the left bank, is the native quarter on another hill. A market is held every Monday for cereals, wool, and cattle. There is a stud farm for the breeding of pedigree Arab horses, which are supplied to most of the remount depots in Algeria, about 4 miles north-east of the town on the road to Teniet el Had; nearby is a Spahi fort or smala. The Djedar, thought to be funeral monuments of Berber princes dating from the sixth and seventh centuries, are interesting local antiquities. They are in two groups, one about 20 miles from Tiaret in Djebel Hadjar and the other near Frenda.

The citadel occupies the site of the Roman Tingartia. Tiaret was a town of note at the time of the Arab invasion in the seventh century, and later, in 761, was taken by Abd er Rahman ibn Rostem, the founder of the Beni Rostem dynasty and of the Ibadite kingdom, of which Tiaret became the capital. In 933 the Fatimites gained possession of the town, which lost its political importance and for a long period was included in the sultanate of Tlemcen. During the sixteenth century it fell to the Turks. It was occupied by the French under General Lamoricière in 1843, and the modern town dates from this year.

Communications

Rail: Tiaret is on the narrow-gauge line from Mostaganem to Burdeau via Relizane, the junction on the Algiers–Oran main line.

Road: Tiaret is at the cross-roads of the Routes Nationales from Relizane to Aflou and from Mascara to Teniet el Had and Affreville. Secondary roads lead west to Prévost-Paradol and north to Inkermann and Orléansville.

TIGZIRT, *see* p. 164.

TIPAZA (TIPASA), *see* p. 149.

TIZI OUZOU. Population, urban 3,267 (1,653 Europeans); commune 40,526 (1,796 Europeans). Altitude 624 feet. Chief town of an arrondissement and a commune de plein exercice. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 110/190). Hospital. Fire brigade. Hotels (4). Garages (9).

Tizi Ouzou is an important administrative centre in one of the most densely populated parts of the Grande Kabylie, about 65 miles from both Algiers and Bougie. The town lies in the narrow valley of the Oued Tizi Ouzou and is separated from the Sebaou valley by Djebel Beloua, the slopes of which are covered with olive groves and rise steeply to 2,293 feet.

Tizi Ouzou was built by the Turks, but has been enlarged since the French occupation. The native town is separate from the European and overlooks the Sebaou valley. The European quarter to the south is modern, with shops and cafés; the streets are planted with trees. The Town Hall, the Roman Catholic cathedral, and a new mosque are the principal buildings. The native market is held on Saturdays near the station and is attended by many Kabylies, who bring sheep, cows, mules, honey, oil, leather, and corn. Gandouras and foutas (Vol. I, p. 221) are sold, and there is an important export trade in oil, olives, dried figs, and early grapes. The water-supply is from springs and from the river.

Communications

Rail: Tizi Ouzou is the terminus of the normal-gauge branch-line from Ménerville on the Algiers–Constantine main line. The station is about a mile south-west of the town.

Road: The Route Nationale from Algiers to Bougie passes through Tizi Ouzou. A third-class road goes north to Tigzirt on the

coast, and another runs west to join the road from Mirabeau to Dra el Mizane. There are local roads to many of the villages in the mountains.

TLEMSEN (Fig. 19, Photos. 14, 102). Population 54,263 (13,382 Europeans). Altitude 2,625 feet. Chief town of an *arrondissement*, a *commune de plein exercice*, and a military subdivision. Brigade de gendarmerie. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 115/200). Drainage. Hospital (military). Meteorological station. Fire brigade. Hotels (13). Garages (16).

Tlemcen is 68 miles south-west of Oran and 34 miles east of the Moroccan border. It stands on the edge of the Hennaya or Eugène-Étienne plain at the foot of almost perpendicular red cliffs. These form part of the Lalla Setti hills, which rise to 4,010 feet and are a branch of the wooded *Monts de Tlemcen*. The plain extends westward to the plain of Marnia, and is fringed on the north-west by the *Massif des Traras*. Through the gap cut by the *Oued Tafna* in this massif the Mediterranean can be seen from the higher parts of the town. North-east of Tlemcen the *Seba Chioukh* and the *Monts du Tessala* rise in the distance.

Tlemcen is famous in Arab and Berber history for its Moorish art and civilization, and is one of the most interesting towns in Algeria. With the exception of the Great Mosque, which dates from the twelfth century, almost all the monuments are from the end of the thirteenth century or the first half of the fourteenth century, and are contemporary with those of Fes in Morocco and Granada in Spain. There were three ancient lines of fortifications, the walls and towers of which are in great part destroyed, but the wall built by the French still encircles the town. The natives have preserved their own characteristics better than in any other town of northern Algeria. Besides Arabs and Berbers there are nearly 5,000 Jews and also groups of *Koulougis*, or descendants of Turks and Arab women (Vol. I, p. 213), and negroes, who were formerly slaves.

The various quarters of Tlemcen are grouped around the Great Mosque, the *Place de la Mairie*, and the *Place d'Alger*. Immediately to the south-west and west of the *Rue de France* is the Jewish quarter with narrow streets and *culs-de-sac*, and low, wretched houses crammed with people even in the basements. Farther south-west is the *Koulougis'* quarter, which is limited on the north by the *Rue Eugène-Étienne*, with the cavalry barracks and the native craft-school.

The Moorish quarter lies south-east of the Place de la Mairie, and the business area with its covered market and workshops is to the north-east. The north-western part of the town is modern and entirely French in character, and has all the civic buildings. It centres on the Place St. Michel, and its principal street is the Boulevard



FIG. 19. *Tlemcen*

National. The Méchouar or citadel, built about 1145 and formerly the residence of the Sultan, is in the southern part of the town: it is now used as barracks. At the time of the French occupation there were sixty-four mosques, several of which have disappeared. The Great Mosque (1136) and the mosques of Sidi Ahmed bel Hassan (1298), now a museum, and of Sidi el Haloui (1353) are the most interesting. To the west, beyond the walls, is the Sahrij, a great basin 200 yards long, 100 yards wide, and 3 yards deep; it was built in the fourteenth century and was once filled with water, but is now dry.

The present water-supply comes from the falls of el Ourit (Photo. 62; Vol. I, Photo. 11). In the immediate neighbourhood of Tlemcen there are several villages and ruins of interest, such as the remains of the fortifications of Agadir to the north-east, el Eubbad or Bou Médine to the south-east, and Mansoura to the south-west, built in the early fourteenth century and containing many fine examples of Moorish architecture.

Tlemcen has a considerable trade in olive-oil, wool, figs, corn and flour, cattle, and carpets and other manufactured goods. Much of the alfa and vegetable fibre of the department of Oran is packed in the town. Many-coloured haiks and blankets are made, and also the red shawls worn as mourning by Jewish women in western Algeria. The market is held daily and a cattle market on Mondays. Onyx and agate are quarried in the neighbourhood at Ain Tekbalet on the Oued Isser (p. 254), and there are silver-lead mines at Garrouban (Ghar Rouban) in the Monts de Tlemcen (p. 243).

Roman Pomaria occupied a site east of the present town, but was ruined after the Vandal invasion and replaced in the eighth century by Agadir. The modern Tlemcen was founded in 1080 and soon incorporated Agadir. Throughout the Middle Ages Tlemcen remained the capital of the central Maghreb, and was at the height of its prosperity between 1236 and 1359 under the Zianids and Merinids from Morocco, when it became the centre of the trade with Europe. From the sixteenth century Tlemcen declined and in 1553 became a dependency of the beylik of Algiers. When the French entered Algeria in 1830 the sultans of Morocco were disputing the possession of Tlemcen with the Koulouglis, who fought first for themselves and afterwards for France. In 1835 Abd el Kader sought to re-establish the ancient empire of Tlemcen, but retreated before Marshal Clauzel in 1836. The Treaty of Tafna a year later restored the town to Abd el Kader, but with the renewal of the war in 1842, Tlemcen was finally occupied by the French.

Communications

Rail: Tlemcen is on the normal-gauge line from Oran and Sidi bel Abbès to Oudjda, Fes, and Casablanca. It is also the junction for the narrow-gauge line north to the port of Beni Saf.

Road: Two Routes Nationales from Oran converge on Tlemcen, one following the northern shore of the Sebkhah d'Oran and passing through Ain Témouchent and Pont de l'Isser, and the other running farther south through Ste. Barbe du Tlélat and Sidi bel Abbès. The

Route Nationale continues west through Marnia into French Morocco. It is crossed at Tlemcen by the Route Nationale from Beni Saf to el Aricha. A secondary road runs north-west to Nedroma and Nemours, and there are numerous other local roads.

TOUGGOURT. Population 2,525 (270 Europeans). Altitude 264 feet.

Chief town of the Territoire de Touggourt, a commune mixte, and an annexe. Electricity (3-phase, 115/200). Infirmary. Meteorological station. Wireless. Bureau arabe. Hotels (3). Garages (3).

Touggourt is 260 miles south of Constantine and 150 miles east of Ghardaia, in the valley of the Oued Igharghar. North and south of the town sand-dunes alternate with chotts; to the east a great expanse of dunes stretches towards el Oued, and to the west small hills alternate with dunes.

Although the population of Touggourt itself is only 2,525, the surrounding villages of Nezla, Sidi bou Djenane, Beni Souad, and Sidi bou Aziz, which act as suburbs, increase the total population to nearly 10,000. There are three districts in Touggourt; to the north near the station is the Ballouche quarter inhabited by Europeans and Ouled Nails. To the west are the Medjaria, or Jews converted to Islam; here the Place Colonel Pujat is surrounded by public buildings, including the bureau arabe, infirmary, and barracks. Between these two quarters is the district inhabited by the Medjaria and Rouarha, a tribe of remote Berber origin which now bears closer resemblance to negroes. On the east is the Place du Marché, where the daily market is held; the most important is that held on Fridays, especially between November and March. Most of the houses are built of mud, though some are built of the clay-stone such as is used at el Oued (p. 94); most of them have only a ground floor. The main streets are arcaded, and many of the side streets are covered over in places. In the oasis there are 170,000 date-palms, beneath which cereals and vegetables are grown. Dates are the principal export. Water-supply, both for the town and the oasis, is from artesian wells.

Touggourt has been besieged and sacked on several occasions—in the fourteenth century by the Hafside of Tunis, in the sixteenth by Salah Rais, Beylerbey of Algiers, and in the eighteenth by Salah, Bey of Constantine. In 1844 the Sultan of Touggourt recognized French authority, but on his death ten years later his successor rebelled, and the town was only retaken after a battle at Meggarine.

Except for the rebellion of 1871, when the garrison was massacred, the district has been peacefully settled.

Communications

Rail: Touggourt is the terminus of the narrow-gauge line from Biskra.

Road: The Biskra–Ouargla road passes through Touggourt, and other roads lead north-east to el Oued and Tozeur in Tunisia, and west by a devious route to Guerrara and Ghardaia.

CHAPTER XI

PORTS

THE ports of Algeria play a vital part in the economic and commercial life of the country, nearly all of its trade with metropolitan France and with foreign countries being sea-borne. The only overland trade of any significance to-day is that between Algeria and French Morocco, which amounted in 1937 to about 300,000 tons, 70 per cent. of which

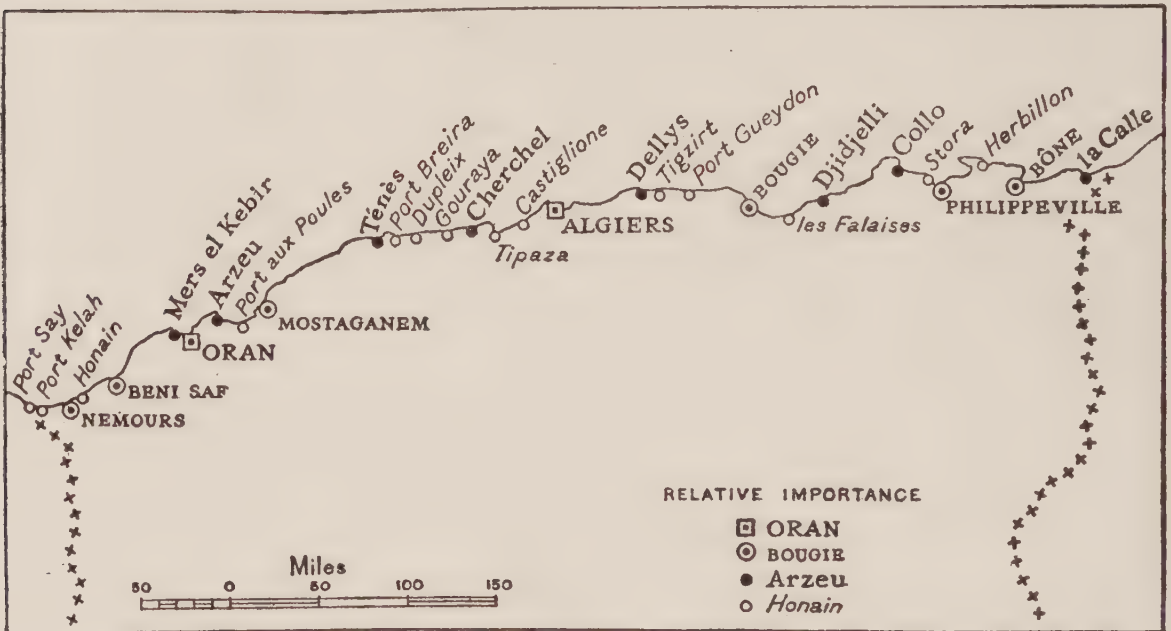


FIG. 20. *The ports of Algeria*

represented Moroccan exports sent through ports in western Algeria. Overland trade between Algeria and Tunisia is small, and that passing over the country's Saharan boundaries is only slight to-day, although there was considerable trans-Saharan trade in the past (p. 277).

The coast of Algeria, described in detail in Vol. I, Chap. III, is generally bold and rocky, with high, and often mountainous, land behind, and, though there are numerous bays affording good anchorage, there are no natural harbours; artificial harbours have, therefore, had to be constructed. Despite these physical difficulties Algeria has a large number of ports, of varying size and usefulness, compared with the extent of the country's trade (Fig. 20). This situation arises from the great length of the coastline and the physical features of the country, which have prevented any one port from serving the whole of Algeria. Moreover, the policy of the administration has encouraged the growth

of many ports. The French authorities have often regarded Algeria not as one country but as three separate departments and have, therefore, favoured the development of Oran, Algiers, and Bône as the main outlets of the departments of Oran, Algiers, and Constantine respectively. These three ports are, however, inadequate to the needs of the whole country, despite their excellent equipment, which is superior to that of many European ports of equal size. Bône, in particular, only serves part of eastern Algeria, and both Philippeville

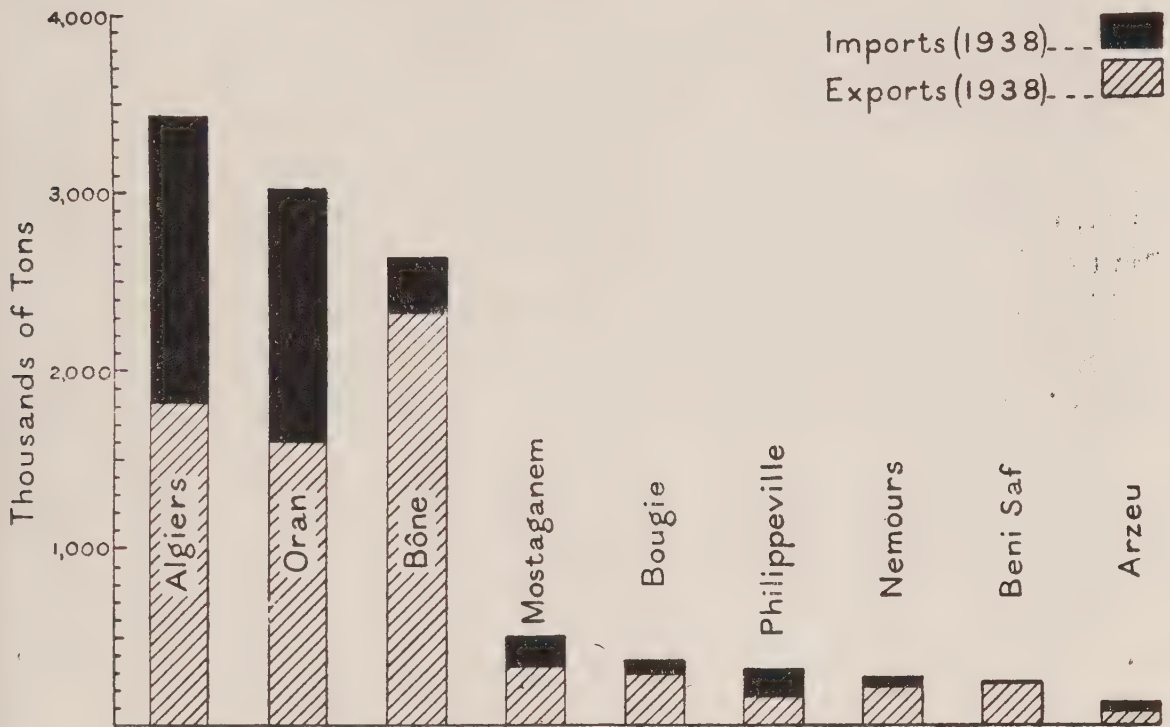


FIG. 21. *The trade of the ports of Algeria, 1938*

(which is 60 miles nearer than Bône to the city of Constantine) and Bougie have developed as ports for the densely peopled and productive region between Constantine and Algiers. Algiers, thanks to its comparatively easy communications inland, is sufficient for most of the trade of central Algeria, but in the west a number of subsidiary ports have developed, notably Mostaganem (and, to a less extent, Arzeu) for the wine and cereal-producing districts east of Oran, Beni Saf for the iron-ore mining district of western Algeria, and Nemours, which is not only an Algerian port but also an outlet for many of the products (especially minerals) of the eastern part of French Morocco.

The relative importance of the nine principal ports of Algeria is shown by the figures given below and is illustrated diagrammatically in Fig. 21. The dominance of Algiers, Oran, and Bône is very marked: altogether they account for about three-quarters of the

country's total trade. The differences in the nature of the trade of these three ports should be noted. Imports approximately balance exports in Algiers and Oran: the weight of the export trade of Bône, however, was seven times that of its imports in 1938; it is the chief exporter of minerals (especially iron ore and phosphates) in Algeria, but Philippeville and Bougie take many of the imports of the department of Constantine. Similar contrasts between the volume of import and export trade are observed in other ports, notably Bougie (large exports of iron ore, zinc ore, and phosphates), Nemours (anthracite and manganese ore from eastern Morocco), and Beni Saf (iron ore is almost its only export). In the descriptions of individual ports which follow detail is given of the trade in the years 1937 and 1938 where information is available: these years are not, however, typical from all points of view. Beni Saf, for example, is usually fourth amongst Algerian ports in view of its heavy exports of iron ore, not eighth as in 1938, whereas Nemours had exceptionally large exports in 1938 and in many years is not much busier than Arzeu and certain other ports omitted from the table, such as Djidjelli.

Trade of the Principal Ports of Algeria, 1937-1939

Port	1937	1938			1939 (first 6 months only)
	Total (tons)	Imports (tons)	Exports (tons)	Total (tons)	Total (tons)
Algiers . .	3,672,790	1,631,432	1,828,527	3,459,959	1,892,453
Oran . .	2,616,540	1,444,477	1,606,437	3,050,914	1,320,672
Bône . .	2,433,346	311,616	2,334,406	2,646,022	1,687,878
Mostaganem .	357,702	161,861	340,059	501,920	233,902
Bougie . .	417,742	65,693	295,039	360,732	211,098
Philippeville .	440,576	168,581	168,736	337,317	170,702
Nemours .	238,221	57,494	222,519	280,013	120,710
Beni Saf .	587,007	7,278	234,960	242,238	147,650
Arzeu . .	180,546	50,373	80,823	131,196	94,590

Altogether 3,956 ships with a total tonnage of 7,163,000 entered the ports of Algeria in 1938: about three-quarters of these were French vessels, to which shipping between Algeria and metropolitan France is reserved. Further information regarding Algerian shipping is given on p. 285, and summaries of the main shipping routes before the present war will be found on pp. 421-423.

As Algeria lies alongside one of the main shipping routes of the world, both Algiers and Oran are large coaling stations; to a less

extent Bône also shares in this trade. Algiers has captured some of the coaling trade of Gibraltar and Malta, but in recent years has given place to Oran, which in 1936 supplied coal to 2,553,000 tons of shipping, compared with the 2,228,000 tons calling at Algiers. Both ports supply more than 1 million tons of coal to vessels each year. All of it has to be imported, and more than half the trade is in the hands of British firms. Oil fuel cannot be supplied in bulk by any Algerian port, and vessels have to call at Gibraltar, Tangier, or Bizerta.

In addition to ports in the usually accepted sense, a number of roadsteads and loading-points have been included in this chapter: many of these are very small and information concerning them is scanty. The principle adopted in giving population statistics is that followed in the Gazetteer and explained on p. 57. As in the Gazetteer, much of the information given in the heading of each port described below is based on the directory *Didot-Bottin, Annuaire du Commerce* (Paris, 1939). Details of administration, police, and justice are explained in Chap. IX, and information regarding roads, railways, and other communications is given in Chaps. XV, XVI, and XVII. The districts surrounding the coastal towns and ports have been described in Vol. I, Chaps. II and III. To facilitate reference to these chapters the ports are described in their geographical, not alphabetical, order from Port Say in the west to la Calle in the east. Fig. 20 shows their approximate positions with some indication of their relative size.

PORT SAY (ADJEROUD). Lat. $35^{\circ} 05' N.$, long. $2^{\circ} 13' W.$ Population 207. Hotels (2).

Port Say or Adjeroud is a small harbour consisting of two short piers, built in 1906, on the western frontier of Algeria, about 1 mile east of the mouth of the Oued Kiss (Skiss). It is now silted up and unusable. Formerly it was the port of export for the iron ore from the Sebabna mine (now exported from Port Kelah, p. 118) and had a small trade with the interior: it remains a customs post. On the opposite (Moroccan) bank of the river is the small sea-side resort of Saidia (population 200), which it has been proposed should be made into a port on the Mediterranean coast of the French Zone of Morocco. The native market town of Souk Adjeroud is $2\frac{1}{2}$ miles inland.

Communications

Road: A road leads inland to join the Oran–Oudjda main road between Marnia and Oudjda: there is a branch to the port of Nemours.

PORT KELAH (Photo. 51). Lat. $35^{\circ} 05' N.$, long. $2^{\circ} 07' W.$

Port Kelah is an open loading-point for iron ore on the eastern side of Pointe bou Madane, 2 miles east of Cap Milonia. The ore comes by aerial cableway from the Sebabna mine, nearly 4 miles to the south (p. 237). The 326-feet-long pier has a conveyor which loads ore at the rate of about 900 tons per hour. The depth of water at the berth is 24 feet. There are three shore moorings and two mooring buoys.

Communications

Road: A track leads south-west from Port Kelah to the road from Port Say to Nemours.

NEMOURS (Fig. 22; Vol. I, Fig. 24). Lat. $35^{\circ} 06' N.$, long. $1^{\circ} 51' W.$

Population, urban 3,269 (2,086 Europeans); commune 7,515 (2,615 Europeans). Altitude 13 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie. Electricity (3-phase, 115/200). Hospital (military). Fire brigade. Meteorological station. Hotels (3). Garages (4).

Nemours, the most western of the larger ports of Algeria, is a small artificial harbour about $4\frac{1}{2}$ miles west of Cap Tarsa in the eastern part of the bay into which the Oued el Marsa flows. The town lies immediately behind the harbour on the east side of the river and at the foot of cliffs and steep slopes reaching over 400 feet in the Touent plateau, beyond which rises the Massif des Traras. It serves as an outlet for eastern Morocco, especially for the livestock industry of the High Plateaux and the mines of Djerada (anthracite), the Berguent district (lead and zinc), and Bou Arfa (manganese). It owes this activity not to its physical conditions, which are far from favourable to the development of a port, but to its superiority over the single roadstead of Saidia on the short Mediterranean coast of the French Zone of Morocco.

History

Nemours was known by the Romans as Ad Fratres, a name retained by the two columnar rocks (one 79 ft. high), about 300 feet from the shore, known as les Deux Frères. In the eleventh century the port had a *ribat* or monastery and was protected by a castle. The remains of the old town, the Turkish Djemaa Ghazouat (the pirates' den), are on the Touent plateau and include an old Berber castle. About half a mile to the west is the modern town, founded in 1844 as a military post near the Moroccan frontier, 22 miles distant. About $7\frac{1}{2}$

miles to the south-west is the koubba (tomb) of Sidi Brahim where Abd el Kader in 1845 trapped Colonel Montagnac and 416 soldiers, killing all except a dozen.

Industry and Commerce

Besides being a commercial port for both eastern Morocco and

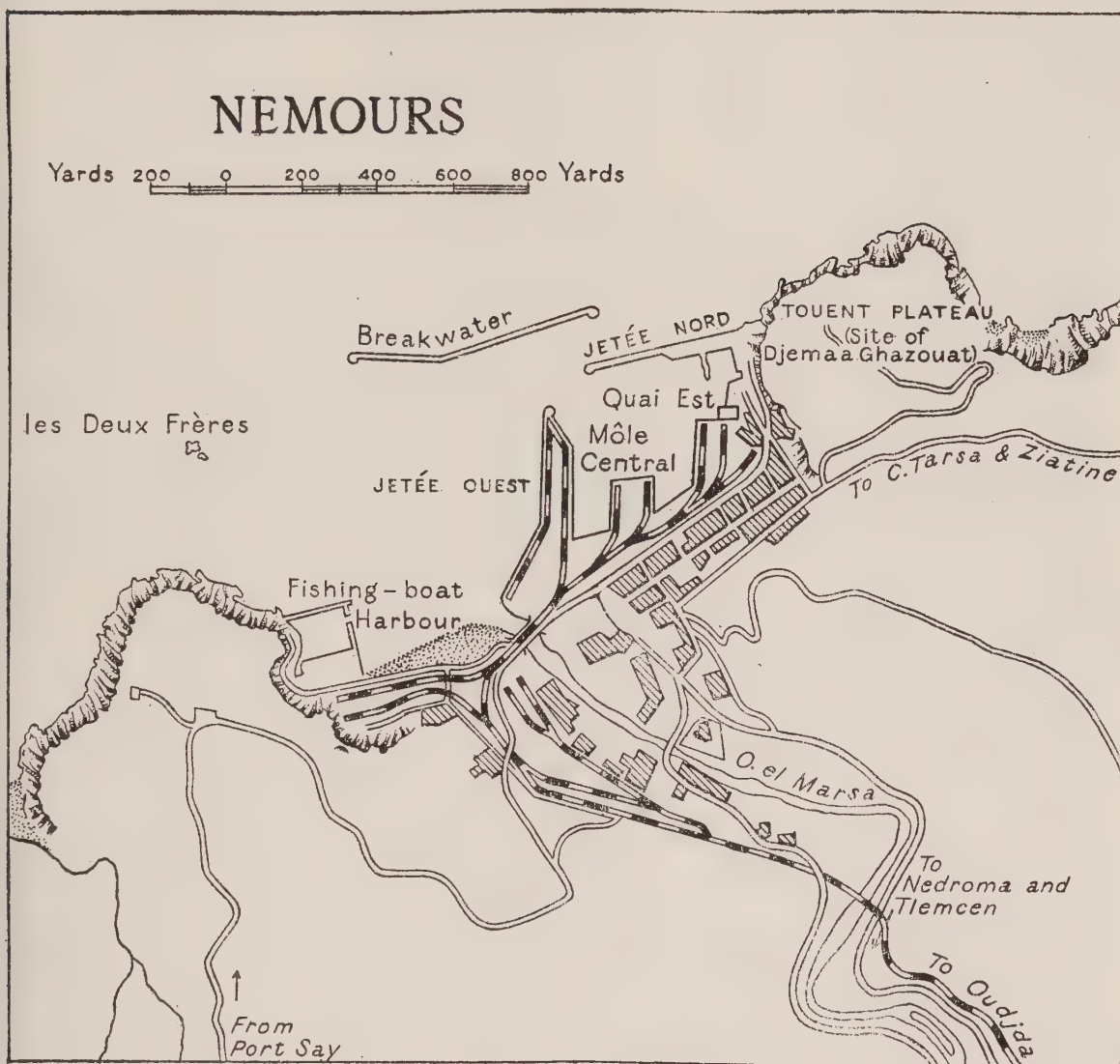


FIG. 22. *Nemours*

The symbols used in this map and also in Figs. 23-45 are explained in Fig. 15

Algeria, as explained above, Nemours is also an important fishing-port, mainly for sardines and allaches (a type of large sardine), and the chief fish-curing centre in Algeria (p. 258). In 1936, 3,436 tons were landed at the port. It has recently become a summer and winter health resort because of its exceptionally mild climate. There are sardine canneries, tile works, and vegetable-fibre factories in the town.

The principal imports are manufactured goods and, in recent years, material for the trans-Saharan railway extension from Kenadza

(p. 452). The chief exports are esparto grass, cereals, carobs, vegetables, tizra (sumach dye), timber, vegetable fibre, anthracite and mineral ores (mainly from French Morocco), marble, hides, and skins. There is a considerable coasting trade with Algiers, especially in coal. The trade figures for 1937 and 1938 were as follows:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	448	414,588	50,725	187,496
1938	393	414,746	57,494	222,519

Description of Port

The harbour is protected on its northern and western sides by two jetties. The entrance is between the heads of these and faces north-westward: it is 310 feet wide with depths of 50 feet, and is sheltered by a detached breakwater, 2,000 feet long, which gives excellent protection in the harbour from all except westerly winds. The harbour has been dredged to a depth of 28 feet, though vessels of 6,000 or more tons should not approach within 20 feet of the jetties and embankments owing to their slope. The Jetée Ouest is 1,650 feet and the Jetée Nord 1,320 feet long. The Quai Est is 525 feet long, and the Môle Central in the southern part of the harbour is 350 feet long and 325 feet wide.

The small fishing-boat harbour, formed by two breakwaters, is distinct from the main harbour, and lies in the western part of the bay. The entrance faces east and is about 75 feet wide. The harbour is about 300 feet square, with a reported depth of 15 feet.

Facilities. Sheds and storage space are available on the Môle Central and the Quai Est. There is a small slip and a crane of 4 tons, and minor repairs can be effected; there is another slip for small craft in the south-western corner of the fishing-boat harbour. A pilot and lighters are available. There are excellent supplies of water. A small stock of anthracite (up to 1,000 tons) is normally maintained. All the main quays are connected to the railway system. Unloading can be carried out by ships' appliances either alongside the quays or by lighters.

Communications

Rail: There is a normal-gauge railway from Nemours to Zoudj el Béghal, 11 miles east of Oudjda, on the Oran-Casablanca line.

Road: A secondary road follows the valley of the Oued el Marsa to Nedroma, where it branches east to Tlemcen and south to Marnia and Oudjda. There are other roads leading south-west to Port Say and east into the hilly country behind Cap Tarsa as far as Ziatine.

HONAIN. Lat. $35^{\circ} 10' N.$, long. $1^{\circ} 43' W.$

Honain is an anchorage in a small cove with a sandy beach on the north-eastern side of Mersa Honain (Baie de Honain), the most marked indentation of the coast between Cap Noé and Cap d'Acra. There are four small piers for the loading of iron ore brought by overhead cable (capacity 15 tons per hour) from the mines at Ghar el Maden (Bab M'Teurba), $4\frac{1}{2}$ miles distant (p. 237). The ore is transferred by lighters to ships anchored in the bay. The trade consists exclusively of the export of iron ore, but since 1932 production has been almost negligible.

Honain has an important weekly market. Near by are the remains of an old Berber town, which served in medieval times as the port of Tlemcen. The town was occupied in 1531 by the Spanish, who abandoned it three years later after destroying it completely.

Communications

Road: Communications inland and along the coast are very poor, the roads to Nemours and Oudjda being little more than tracks in places.

BENI SAF (Fig. 23, Photo. 2 ; Vol. I, Fig. 25). Lat. $35^{\circ} 19' N.$, long. $1^{\circ} 23' W.$ Population 13,747 (4,248 Europeans). Altitude 297 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Fire brigade. Hotels (4). Garages (3).

The artificial port of Beni Saf has been built midway between Cap d'Acra and Cap Oulassa for the shipment of the iron ore mined in the surrounding hills. The town lies on the eastern side of the narrow valley of the Oued Sidi Ahmed.

History

Beni Saf is essentially modern and dates only from the discovery of iron-ore deposits in the latter half of the nineteenth century. The harbour was built between 1876 and 1881 by the C^{ie} de Mines de Soumah et Tafna, which was absorbed by the C^{ie} Mokta el Hadid in 1878.

Industry and Commerce

The mining industry (p. 237) dominates the activities of the town and port, and almost all the inhabitants are employees of the C^{ie} Mokta el Hadid. The nearest mine—the surface working at Ghar Baroud—is only 2 miles to the south. There are other mines, linked

to Beni Saf by overhead cables and long tunnels, at Camerata (6¼ miles to the east in the Cap Oulassa massif), Dar Rih, and Sidi es Safi (5¼ miles to the south-east): the latter produces magnetic iron. The port is also the main fishing centre in western Algeria: over 4,000 tons of fish were landed in 1936. There are several fish-curing factories in the town. Trawlers and small craft up to 100 tons are built.

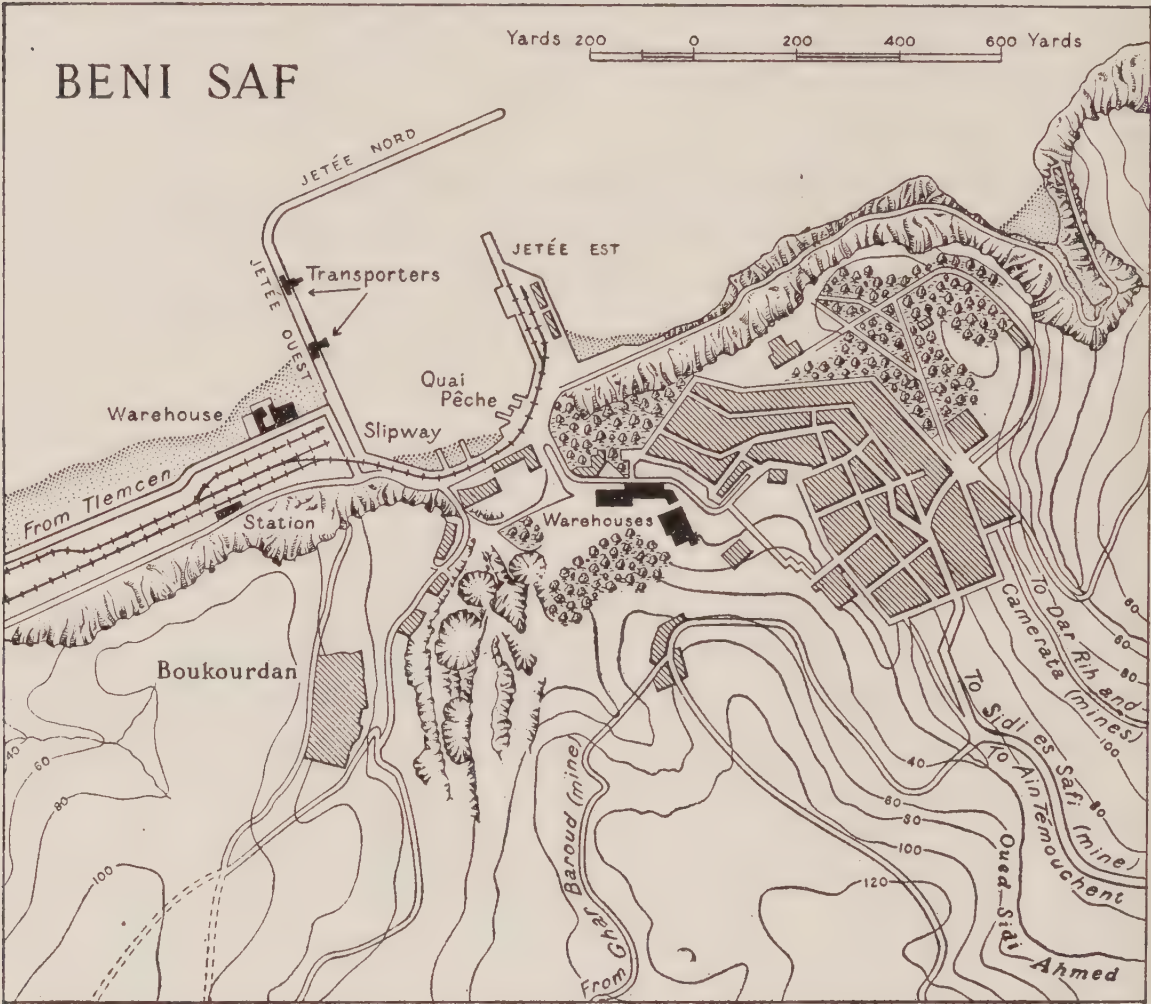


FIG. 23. Beni Saf

The import trade consists of machinery and manufactured goods needed by the mines and the workers, and, as shown below, is insignificant compared with the large export trade, consisting mainly of iron ore, with small amounts of zinc ore, marble, and onyx, which are mined in the district. The trade of the port in 1937 and 1938 is shown below:

Year	No. of ships	Tonnage of ships	Imports (tons)	Exports (tons)
1937	287	438,436	18,173	568,834
1938	282	408,506	7,278	234,960

Description of Port

The harbour is rectangular and covers 45 acres of Mersa Sidi Ahmed. It is formed by two jetties, the Jetée Est (960 ft. long) and the Jetée Ouest (1,440 ft.): the latter is continued by the Jetée Nord (1,680 ft.). The entrance between the Jetée Est and the Jetée Nord is 570 feet wide and faces north-east. It is liable to silting in the winter, but depths of from 23 to 26 feet are maintained by dredging, though shoal water surrounds the head of the jetties and makes pilotage advisable. Entry is difficult with fresh north or north-west winds and in bad weather is dangerous. During north-north-westerly gales the sea sometimes breaks about 1 mile off the harbour.

Vessels can anchor in the harbour and secure their sterns to one of the jetties; the holding ground of fine sand is good. On the western side of the Jetée Est is a quay, 180 feet long, where vessels drawing up to 20 feet can secure alongside. Near the root of Jetée Est is the small Quai Pêche, from which three short jetties project.

Facilities. There is a floating sheerlegs of 40 tons, and a slipway, 131 feet long, at the workshops of the C^{1e} Mokta el Hadid, where most repairs can be undertaken. Water is laid on to the Jetée Ouest, on which are two ore-loading transporters. There are mineral lines to this jetty, and an extension of the narrow-gauge railway serves the Jetée Est.

Communications

Rail: A narrow-gauge line following the valley of the Oued Tafna joins the port to the Oran–Oudjda normal-gauge line at Tlemcen.

Road: Beni Saf is linked to the road system of western Algeria by a Route Nationale to Tlemcen and a secondary road to Ain Témouchent.

MERS EL KEBIR (Figs. 24, 25; Vol. I, Photo. 34). Lat. 35° 44' N., long. 0° 42' W. Population 5,467 (4,826 Europeans, mainly Italians). Altitude 297 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Fire brigade.

Mers el Kebir is a small town with a growing population on the western side of the Golfe d'Oran and about 5 miles north-west of Oran. Before the war it was intended to be the chief French naval base in Algeria and the second in French North Africa. Work began in 1937, but the harbour was far from complete in 1939, when 3,000 men were being employed in day and night shifts. Although work

continued until the time of the Allied occupation of Algeria in November 1942, it remained little more than a roadstead protected by a half-completed mole. It lies at the foot of Djebel Santon, the easterly projection of which forms Pointe Mers el Kebir, and is on

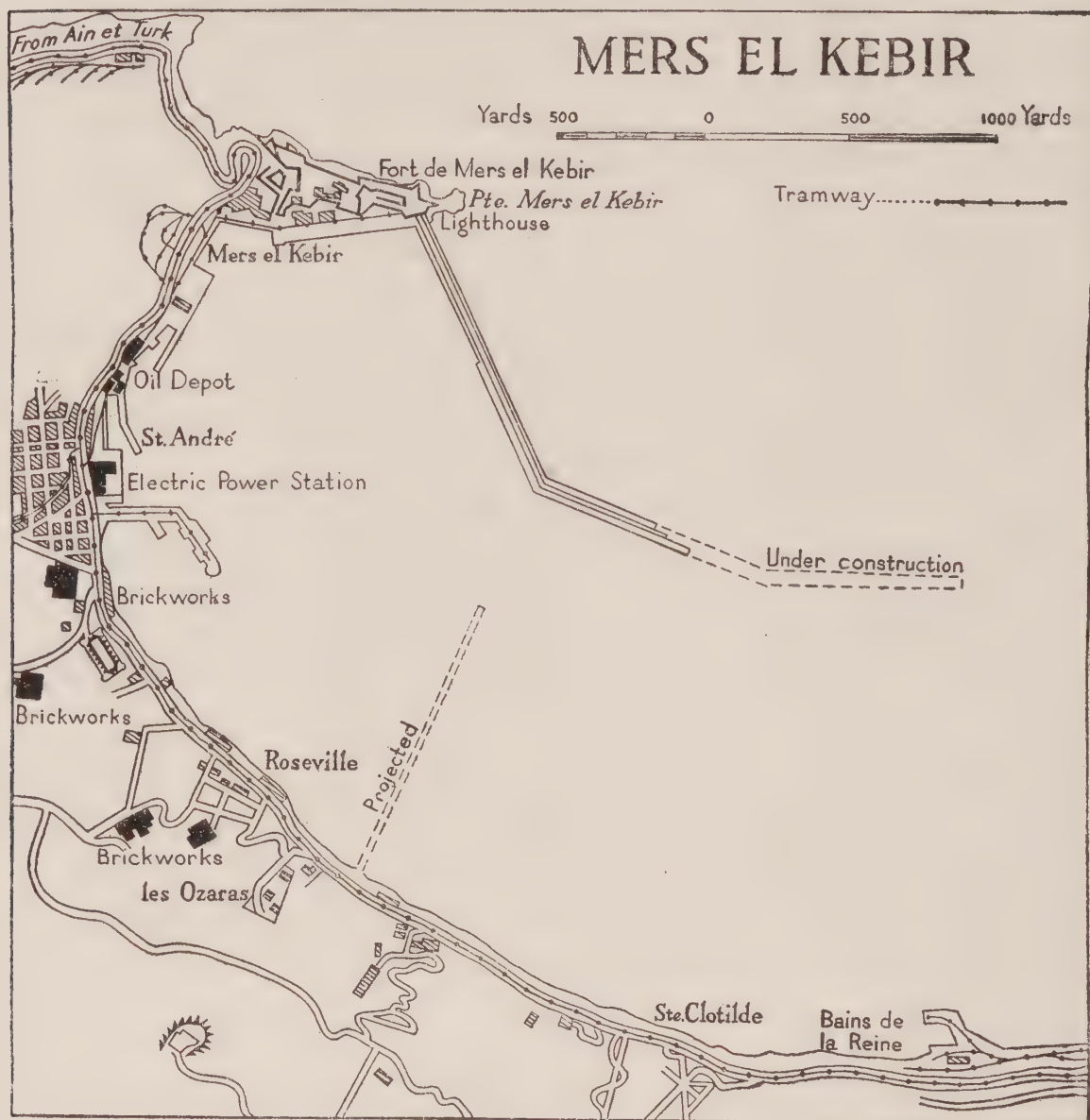


FIG. 24. *Mers el Kebir*

the northern shore of the bay of Mers el Kebir, the best natural anchorage on the Algerian coast with accommodation for forty warships and 150 other vessels.

History

Mers el Kebir ('the great port') has always had a close association with sea-power, and may have been the Portus Magnus of the Romans (cf. p. 135). As early as the twelfth century it was one of the naval

arsenals of the Almohads under Abd el Moumen. In the fifteenth century the Zianid rulers of Tlemcen built a small town here which after the fall of Grenada (1492) became a pirate stronghold. The Portuguese occupied it from 1415 to 1437 and again from 1471 to 1477. On 23 October 1505 it fell to the Spanish under Diego Fernandez de Cordova, Marquis of Comares. With the Spanish occupation of Oran four years later the history of Mers el Kebir was linked with that of Oran, described on p. 128. The town was occupied by the French without difficulty on 27 July 1830, after the fall of Algiers. It was evacuated after the July revolution in France, but reoccupied on 14 December of the same year by forces under the command of General Damrémont.

On 3 July 1940 units of the French navy at Mers el Kebir were shelled by ships of the Royal Navy. The battle-cruiser *Dunkerque* and the battleship *Provence* were damaged, the battleship *Bretagne* was sunk, and two destroyers were sunk or set on fire. The battle-cruiser *Strasbourg* escaped, but was subsequently damaged. The seaplane carrier *Commandant Teste* also escaped, after being set on fire.

Industry and Commerce

The only industries are fishing and those connected with the naval use of the port. Mers el Kebir is responsible for most of the fish reported as landed at Oran (1,755 tons in 1936), the fishing being largely in the hands of the Italians, who constitute the bulk of the town's European population. Sardines and allaches are the chief fish caught: many are cured and canned. The trade consists solely of imports of oil fuel, coal, and naval stores, mostly brought in through Oran.

Description of Port

The mole extends for about 3,100 feet south-south-east of Pointe Mers el Kebir, and is roughly parallel to the shore and about three-quarters of a mile from it. It then extends for 1,600 feet in an east-south-easterly direction; the French authorities proposed to continue this part of the mole for another 1,100 feet. The mole was then to extend a further 2,100 feet in an easterly direction. The harbour was to have been closed on the east by a breakwater extending northward from les Ozaras, on the shore between Mers el Kebir and Oran about $1\frac{1}{4}$ miles south of the Fort de Mers el Kebir: the approximate position and extent of this breakwater, as shown in the published plan in the *Statistique des Ponts et Chaussées*, 1936, are given in Fig. 24.

There are deep-water quays on the inner side of the mole and on the south side of Fort de Mers el Kebir, and quays for small craft between Mers el Kebir and St. André. At the latter place there is a mole, about 1,400 feet long, extending first eastward and then south-eastward.

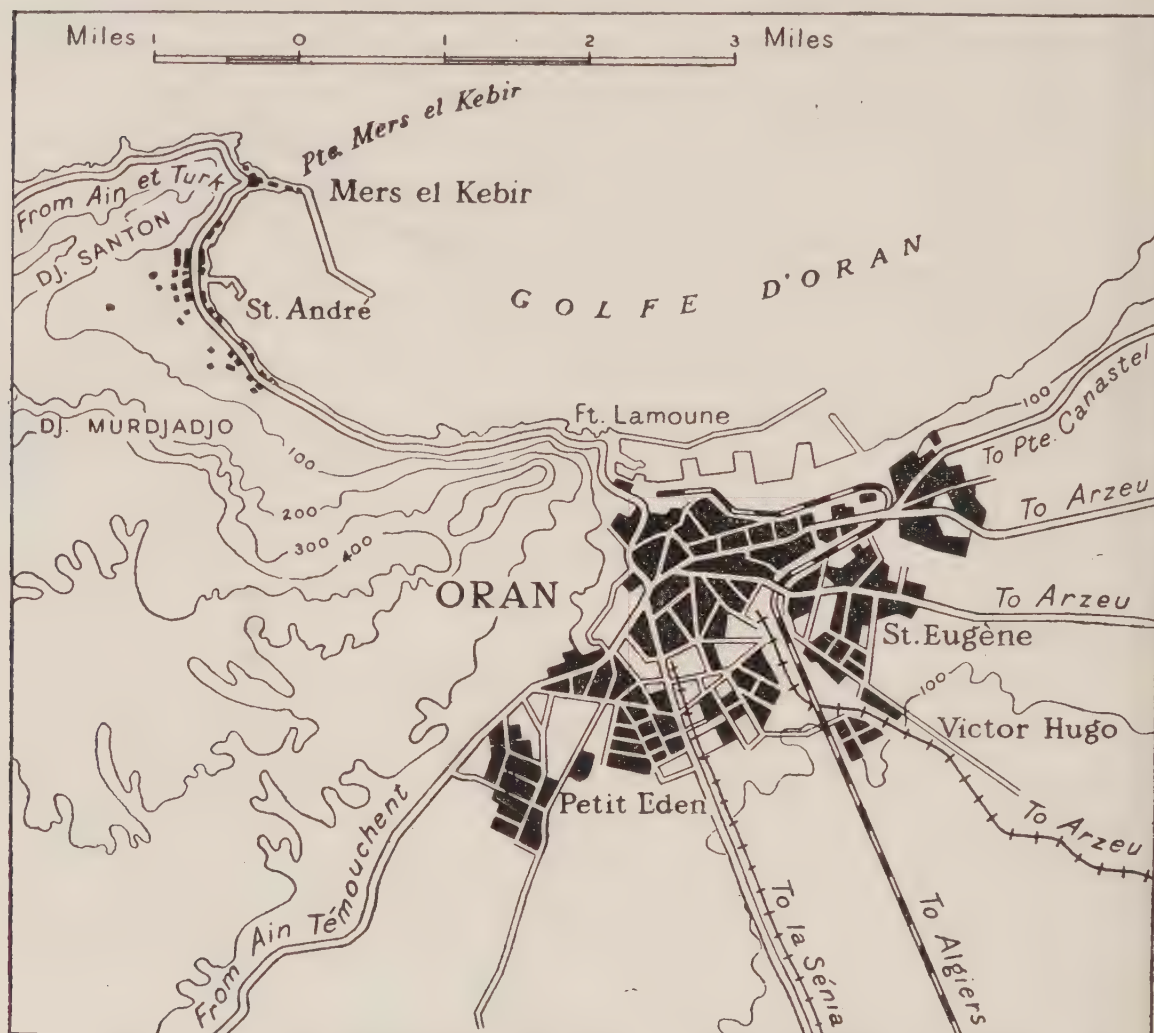


FIG. 25. *The geographical setting of Oran and Mers el Kebir.*
Heights are in metres

Facilities. These include a number of cranes (some engaged upon constructional work), about five tugs, and twenty or more hoppers and lighters. There are normally large stocks of coal, and extensive oil-storage facilities (p. 441): oil fuel is supplied to vessels in motor-lighters carrying 2,000–3,000 tons. The electric power station is at St. André and has probably been linked with the Oran power station (p. 274). Water is laid on to the basin at St. André.

Communications

Rail: The nearest railway is at Oran (p. 134), to which a tramway runs from Mers el Kebir.

Road: Mers el Kebir is linked to Oran by a first-class road, which the French authorities were widening before the Allied landings in north Africa. Over 3 miles of this road immediately to the west of Oran are cut through solid rock. Another road, above the present one, was being built round the seaward face of Fort St. Grégoire (San Gregario). To the west of Mers el Kebir a difficult road passes along the coast to Ain et Turk, beyond which it leads north-west to Cap Falcon and west to les Andalouses.

ORAN (Figs. 25, 26; Photos. 17, 18, 63; Vol. I, Photo. 35). Lat. $35^{\circ} 43' N.$, long. $0^{\circ} 38' W.$ Population 200,671 (152,603 Europeans, including many Spanish): with suburbs of Arcole, Mers el Kebir, and la Sénia, 210,821 (159,789 Europeans). Chief town of the department of Oran, an arrondissement, a commune de plein exercice, and a military division. Compagnie de gendarmerie. Courts of Assize and First Instance. Electricity (3-phase, 115/200; 3-phase, 120/210). Gas. Drainage. Hospitals (2 civil, 1 military). Fire brigade. Meteorological station. Wireless. Hotels (about 40). Garages (80-90).

Oran (Arabic *wahran* or ravine), the chief port of western Algeria and the second port in the country, is in the middle of the bight extending from Pointe Mers el Kebir to Pointe Canastel. This bight is itself the central part of the larger bay lying between Cap Falcon and Cap de l'Aiguille (Abuja point). The harbour, which is entirely artificial, is about 5 miles south-east of the roadstead of Mers el Kebir, where a large naval base is being built (p. 123). It has grown, basin by basin, eastward from Pointe Mona, on which Fort Lamoune is situated, and now extends for about $1\frac{1}{2}$ miles. The town is flanked on the west and south-west by Djebel Murdjadjo and on the east by the sandstone plateau of Arcole, which rises from the sea in cliffs 600 feet high. It is built mainly on a plateau about 350 feet high rising steeply from the shore about 300 yards inland from the port. The plateau is broken by a number of streams, the largest being the Ravin de Ras el Ain (Oued Rehi) on the west—now covered over to form the Boulevard Dr. Molle (formerly the Boulevard Malakoff)—and the Ravin Blanc on the east. Since it is almost surrounded by hills and cliffs, it is one of the most easily defended of the ports of French North Africa. Both the native and Jewish quarters are relatively small, and Oran is the most European of the large towns of Algeria, with three Europeans to every native; only about half of

these, however, are French, most of the remainder being Spanish with a mixture of Portuguese.

History

Traces of prehistoric settlement are common in the hills surrounding Oran, but there is no evidence that it was a Roman station, despite suggestions that Oran was the Quiza and Mers el Kebir the Portus Magnus of the Romans (cf. p. 135). According to Arab historians it was founded in A.D. 902 by Andalusian sailors, who gave the town its name. It rapidly became an important seaport, and was captured and recaptured by the successive conquerors of north Africa. Ivory, ostrich feathers, gold-dust, hides, and slaves were exchanged for the manufactures of Venice, Genoa, and Marseilles, but Moslem refugees from Spain gradually undermined its prosperity by making Mers el Kebir a pirate stronghold, so that piracy replaced legitimate trade.

To prevent this piracy the Spanish determined to occupy the town, which fell in 1509, four years after the capture of Mers el Kebir, after a fierce assault in which 4,000 natives were killed and 8,000 taken prisoner. From this time until 1791 the city remained in Spanish hands, except for a period of Turkish rule from 1708 to 1732, but all attempts to push inland proved unsuccessful. In 1790 an earthquake, the tremors of which lasted for more than six weeks, destroyed most of the town and killed many of the inhabitants, including one-third of the garrison. Immediately afterwards the town was besieged by the Bey of Mascara with 30,000 men, and in August 1791 the Spanish commander had to surrender. From this date until the French occupation the city remained in Turkish hands. Spanish influences still remain, and many of the present European population are Spanish (p. 54). After the final occupation of Mers el Kebir by the French in December 1830 (p. 125), Marshal Clauzel entered Oran on 4 January 1831, and took formal possession of the town on 17 August. In 1832 the population numbered only 3,800, including 2,800 Jews, but under French rule Oran has regained its former commercial activity, and is to-day the second town and port in the country. Fig. 9 illustrates the growth of population since 1876. Since 1848 there have been almost continuous developments in the port. The first basin (now the Vieux Port) was completed in 1864, the Bassin Aucour in 1876, the Bassin du Maroc in 1914, and the Bassin Poincaré and the Avant Port (Bassin Doumergue) since the War of 1914-1918. There have been corresponding increases in the shipping and trade of the port,



16. Algiers from the Îlot de la Marine, looking south-westward



17. Oran from the west

705,000 tons of cargo passing through it in 1898, 1,803,000 tons in 1913, and 3,805,000 tons in 1929.

Description of Town

Oran has few old buildings of interest other than the Spanish walls and forts, which have survived both earthquakes and attacks. There are three main sections—the old town in the south-west, the modern European town, and the ring of modern suburbs. Most of the natives live in the old town and, to some extent, in the Village Nègre and the suburbs of Lamur, Lyautey, and Médiouni.

The old town is built on the steep sides of the Ravin de Ras el Aïn to the south-west of the port. Its streets are steep and narrow, and often nothing more than flights of steps. Its centre is the Place Kléber, from which several roads lead down to the port. Three-quarters of the town was destroyed in the earthquake of 1790, but a number of old buildings remain, including the Château Neuf, the Great Mosque (Mosquée du Pasha), and the Kasba or Castillo Viejo, built by the Spanish in the sixteenth and seventeenth centuries and now used as a prison and barracks.

The modern town has grown up immediately to the east of the old town, from which it is separated by the Boulevard Dr. Molle. Much of it is 300 feet or more above the level of the port, to which it is linked by very steep roads which are followed by electric trams. The centre of the modern town is the Place Foch (formerly the Place d'Armes), from which radiate the principal streets, lined by the main public buildings and shops. The Jewish quarter and the cavalry and artillery barracks are to the south-west. The Village Nègre, with its wide streets and native workshops and markets, lies to the south. Most of the European houses are on the eastern side in the area served by the Rue d'Alsace-Lorraine, the Rue d'Arzeu, and the Rue de Mostaganem, and bounded by the railway line from the port to the town station.

Beyond the modern town there extends a ring of suburbs from Gambetta in the north-east through St. Eugène, Delmonte, Lyautey, and Boulanger to Eckmühl in the south-west. Greater Oran also includes Arcole to the east, la Sénia to the south-east, and Ste. Clotilde, Roseville, St. André, and the town and naval base of Mers el Kebir (described on pp. 123–127) to the north-west.

Industry and Commerce

After Algiers, Oran is the leading industrial centre in the country, with large flour-mills, fish-canneries, breweries, and distilleries. There are also numerous brickworks, especially between Oran and Mers el

Kebir and at St. Eugène, several plants producing cement and lime, a chemical factory at la Sénia (formerly controlled by the Kuhlmann combine), and a tobacco factory. The engineering workshops are some of the largest in Algeria: there are also railway workshops and repair depots. Trawlers and small craft up to 100 tons are built in the port.

As a commercial port Oran serves the whole of western Algeria and is a close rival of Algiers, though it has lost much of its trade with eastern Morocco in recent years since the completion of the normal-gauge railway from Oudjda to Nemours (pp. 118, 361). Arzeu competes with it for the traffic of the southern parts of the department of Oran, especially the districts served by the railway to Colomb Béchar and Kenadza, and Mostaganem deals with much of the trade of the Sersou, Tiaret, and Relizane districts, but Oran has the advantage of superior facilities and better shipping services.

There is a large import and export trade, as shown by the figures given below for the years 1937 and 1938. The chief exports are cereals, wool, esparto grass, cattle, sheep, hides and skins, marble, tan bark, wines, and vegetable fibre. The principal imports include manufactured goods of all types, timber, coal and patent fuel, coffee, sugar, soap, petroleum, tobacco, ground-nut oil, and dates.

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	4,366	7,451,129	1,214,994	1,401,546
1938	4,407	7,410,341	1,440,477	1,606,437

Oran is well supplied with shipping services and is the second passenger port of the country. The principal services are with Marseilles and Port Vendres (pp. 421-422).

As described above (pp. 116-117), Oran is one of the main coaling stations of the Mediterranean, in some years surpassing Algiers. About 1,150,000 tons is supplied to ships annually. Under normal conditions about half of the coaling trade is in the hands of British firms.

Description of Port

The harbour is nearly 3,000 yards long from west to east, and varies in width from 460 yards in the west to about 800 yards in the east. It is enclosed on the eastern side by the Traverse du Large and on the north by the Jetée du Large, which has been built parallel to the shore. In the western part of the harbour there are two small basins facing east—the Bassin Gueydon on the northern side of the Môle du Centre, and the Vieux Port on the southern side. To



18. Oran from the north



19. *Arzeu from the south*



20. *Arzeu from the east*

the east of these basins are four main basins, separated one from another by broad moles and by the short spur jetties (*épis*) which project southward from the *Jetée du Large*: they are, from west to east, the *Bassin Aucour*, the *Bassin du Maroc*, the *Bassin Poincaré*, and the *Avant Port*. The spur jetties have been built to reduce the heavy scend that enters the harbour with westerly gales.

The entrance to the harbour faces east-north-east and is 480 feet wide with depths of 75 feet in mid-channel. Entry is easy in fine weather for vessels with a draught of not more than 35 feet, though special care is necessary during northerly and westerly gales when a current sets southward across the harbour entrance. A west-going current is usually experienced along the shores of the *Golfe d'Oran* in all weathers.

Westerly winds raise, and easterly winds lower, the water-level in the harbour, the difference between the two levels being about $2\frac{1}{2}$ feet.

Avant Port. The *Avant Port*, the most easterly part of the harbour, is bounded by the *Môle du Ravin Blanc* and the *Épi du Ravin Blanc* on the west, the *Jetée du Large* on the north, the *Épi du Large* and the *Traverse du Large* on the east, and the steep cliffs of the shore on the south. The basin is 2,010 feet long and 2,250 feet broad, and has depths of from 36 to 72 feet. The only quay is that of the *Môle du Ravin Blanc*, which, when completed, is designed to serve as a coaling jetty. The southern part of the *Avant Port* is known as the *Bassin Doumergue*.

Bassin Poincaré. The *Bassin Poincaré* between the *Môle Millerand* and the *Môle du Ravin Blanc* is 1,800 feet long and 1,800 feet wide, with depths varying from 33 to 50 feet. A large floating dock is moored in the northern part of the basin, immediately west of the *Épi du Ravin Blanc*. On the western side is the *Quai de Rouen* (the east side of the *Môle Millerand*), where coaling can be done at the rate of about 150 tons per hour, and the *Épi Millerand*. On the south there are two quays—the *Quai Ste. Thérèse* and the *Quai de Brest*, separated by the *Oiling Jetty* and some slipways, off which are moored two small floating docks.

Bassin du Maroc. The *Bassin du Maroc* extends from the *Môle Jules Giraud* to the *Môle Millerand*. It is almost square, being about 1,050 feet on all sides. The depths vary between 24 to 28 feet in the south and 52 feet in the northern half and 55 feet in the entrance, which is 405 feet wide, between the *Môle Millerand* and the *Épi Millerand*. There are quays on its western (*Quai de Marseille*), southern (*Quai Henri Beaupuy*), and eastern (*Quai de Bordeaux*)

sides. The last is mainly occupied, as is the rest of the Môle Millerand, by a large coal dump. Coaling can be rapidly carried out, and several ships can be coaled simultaneously in all weathers on this and the other coaling wharves of the Môle Millerand.

Bassin Aucour. The Bassin Aucour covers a rectangular area about 1,500 feet long and 1,260 feet wide. Its depths vary from 24 feet in the south to 33 feet in the north. To the west lie the Vieux Port and the Bassin Gueydon: on the east is the Môle Jules Giraud, where are situated the Gare Maritime and four large warehouses. The entrance to the basin between this mole and the Épi Jules Giraud is 320 feet wide and 39 feet deep in the centre.

Vieux Port. The Vieux Port, in the extreme south-western corner of the harbour and on the southern side of the Môle du Centre, is a small basin, 840 feet long and 570 feet broad, with depths of 20 feet in the middle. It is almost surrounded by quays and is mainly used for berthing boats and small harbour craft. Fishing-vessels use the western side of the Môle Ste. Marie (Quai de Nemours).

Bassin Gueydon. The Bassin Gueydon, in the north-western corner of the harbour and on the northern side of the Môle du Centre, is 990 feet long and 600 feet broad, with depths of 30 feet. It has quays on its southern and western sides, and the Jetée du Large on the north. The basin was reserved by the French naval authorities for their exclusive use. There are small naval barracks a short distance to the west. At the western end of the basin is a seaplane station (p. 423).

Details of the principal quays are given in the following table:

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
AVANT PORT	Traverse du Large	c. 1,650	..
	Môle du Ravin Blanc (east side)	675	21-43
	Môle du Ravin Blanc (south-east side)	400	10-21
	Môle du Ravin Blanc (head)	500	36
BASSIN POINCARÉ	Môle du Ravin Blanc (Quai de Dunkerque)	1,320	27-43
	Quai de Brest	640	c. 27
	Oiling Jetty	270	27-33
	Quai Ste. Thérèse	390	18-21
	Môle Millerand (Quai de Rouen)	1,260	18-29
BASSIN DU MAROC	Môle Millerand (Quai du Havre)	660	26
	Môle Millerand (Quai de Bordeaux)	720	28
	Quai Henri Beaupuy	1,380	19-24
	Môle Jules Giraud (Quai de Marseille)	780	19
	Môle Jules Giraud (Quai de Port Vendres)	450	23-27

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
BASSIN AUCOUR	Môle Jules Giraud (Quai de Sète)	840	24-25
	Quai de Sénégal (or Quai de la Gare)	1,565	10-11; 23 at 150 ft. off
	Môle Ste. Marie (Quai d'Arzeu)	160	10-16
	Môle Ste. Marie (Quai de Beni Saf)	260	13-15
VIEUX PORT	Môle Ste. Marie (Quai de Nemours)	300	8-13
	Quai Charlemagne	700	3-8
	Quai de la Douane	380	3-10
	Môle du Centre (Quai de Plaisance)	630+110	2-21
BASSIN GUEYDON	Môle du Centre (Quai d'Alger)	730	28
	Môle du Centre (south-west quay)	240	6
	Quai Lamoune	440	(?) alongside; 32 at 140 ft. off

Facilities. There are at least twenty-eight cranes on the quays, with capacities ranging from 1 to 5 tons; many of them are electrically operated, and some are travelling electric cranes. There are also nine floating cranes and one floating sheerlegs. Each of the transporters on the Môle Millerand (the coaling quay) can discharge a 3,000-ton collier in 24 hours, and can also load coal at a rate of 150 tons per hour.

The harbour craft includes twelve small tugs, one dredger, twenty-five large and 200 small lighters, four water-lighters, and numerous small craft.

There are three floating docks, all in the Bassin Poincaré: their normal positions are indicated in Fig. 26. The large dock in the northern part of the basin was built in 1927 and is 722 feet long, with a lifting power of 25,000 tons. The main slipway is by the Oiling Jetty in the Bassin Poincaré. All ordinary repairs can be undertaken either at the naval establishment in the Bassin Gueydon or by the engineering workshops in the town.

All the warehouses are at the western end of the port, the largest being the four on the Môle Jules Giraud and the five on the Quai du Sénégal. The total floor space exceeds 314,000 sq. ft. There is also a large concrete grain elevator and silo behind the Quai Henri Beaupuy (capacity 30,000 tons).

Water is laid on to most of the quays and can also be supplied to vessels by water-boats. Large stocks of coal are normally maintained (cf. p. 130). The oil installations have a capacity exceeding 183,000

cubic yards (140,000 cu. metres): details are given on pp. 441-442. The thermal electricity generating station is on the western side of the Gambetta suburb (p. 274), and the gasworks are to the south of the Bassin du Maroc.

Communications

Rail: There is a normal-gauge line to Ste. Barbe du Tlélat, where the line branches east to Algiers and west to Sidi bel Abbès and Morocco. From la Sénia on this line another normal-gauge railway leads south-west to Ain Témouchent. Oran is also the terminus of the narrow-gauge line to Arzeu, Perrégaux, Colomb Béchar, and Kenadza, and of that to Hammam bou Hadjar. There are four stations—the town station (Oran Ville) and the adjacent narrow-gauge station (Gare de l'État), the port station (Oran Marine), and the station for Hammam bou Hadjar in the Boulevard de Mascara.

The normal-gauge railway serves the quays along the southern side of the port but not the quays along the moles, except for the Quai d'Alger on the northern side of the Môle du Centre: there are, however, railway tracks down the middle of the Môle Jules Giraud and the Môle Millerand. There are extensive marshalling yards and sidings. All these lines are connected with the town railway station by a single line circling round the eastern part of the town. Narrow-gauge trucks which require loading or unloading are carried to and from the quays on special normal-gauge trucks, to avoid transshipment in the town station.

Road: Oran is the centre of a network of roads, the most important being the Routes Nationales east to Arzeu, Mostaganem, and Algiers, south-east to Ste. Barbe du Tlélat and Algiers (with a branch to Sidi bel Abbès), and south-west to Ain Témouchent, Tlemcen, and Oudjda. There are also coast roads east to the Batterie du Canastel and west to Mers el Kebir and Ain et Turk, beyond which the road branches north-west to Cap Falcon and west to les Andalouses.

The port area is linked to the town by means of a double ramp behind the Quai Henri Beaupuy on to the Nouvelle Route du Port.

ARZEU (ARZEW) (Figs. 27, 28, Photos. 19, 20; Vol. I, Photo. 36). Lat. $35^{\circ} 51' N.$, long. $0^{\circ} 18' E.$ Population 8,805 (5,998 Europeans). Altitude 26 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 120/210). Drainage. Hospital (military). Hotels (2). Garages (4). Arzeu is a small port and sea-side resort on the western side of the

[illegible]

- 2

FIG. 26. *Oran*

Golfe d'Arzeu, near the mouth of the Oued Magoun. The roadstead, which is the best in western Algeria after that of Mers el Kebir, lies in the shelter of the mountainous promontory separating the Golfe d'Oran from the Golfe d'Arzeu. The town is on the western side of the harbour. It is regularly built and surrounded by walls with two gates. About half a mile to the south is the modern suburb of Tourville.

History

During the twelfth century Arzeu was one of the main ports of the Almohad ruler, Abd el Moumen. The Italians visited it regularly in the fourteenth and fifteenth centuries, and later the Turks made it an important trading centre, protecting the harbour by a small fort. In 1831 the town was taken by Abd el Kader, but two years later it was occupied by the French under General Desmichels. It became French by treaty in 1837. The citadel was built in 1863.

At St. Leu, 4 miles south-east of the town, there are the ruins of a Roman settlement, which was probably Portus Magnus, though this city is believed by some to have been near the site of Mers el Kebir (p. 124).

Industry and Commerce

Arzeu serves a productive area extending inland to Mascara, Relizane, Saida, and even as far as Colomb Béchar. It is one of the main centres for the export of esparto grass. About 9,000 tons of salt are obtained each year from the depression of el Mellaha, which covers 12,000 acres. The plain to the south of the town is almost entirely under vineyards. There are small sulphur and petrol refineries in the town (cf. p. 251), and a factory making canvas sacks. Tunny fishing is important, and 626 tons of fish of various kinds were landed in 1936.

The trade statistics for 1937 and 1938 are given below. The chief imports are usually oil, coal, timber, sulphur, building materials, and iron and steel goods, and the main exports salt, esparto grass, cereals, cattle, and wine.

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	310	301,232	78,849	101,697
1938	229	202,177	50,373	80,823

Description of Port

The harbour, which has been greatly improved during recent years, lies on the south-western side of Fort de la Pointe (Fort Point), from

which the Jetée Abri projects east-south-eastward for about 1,050 feet. The Jetée Est extends southward for 1,040 feet from a point about 660 feet to the west of the Jetée Abri: the western part is quayed and is known as the Grand Quai. Since 1936 a narrow extension, 1,300 feet long, has been built on to this quay. To the west of the

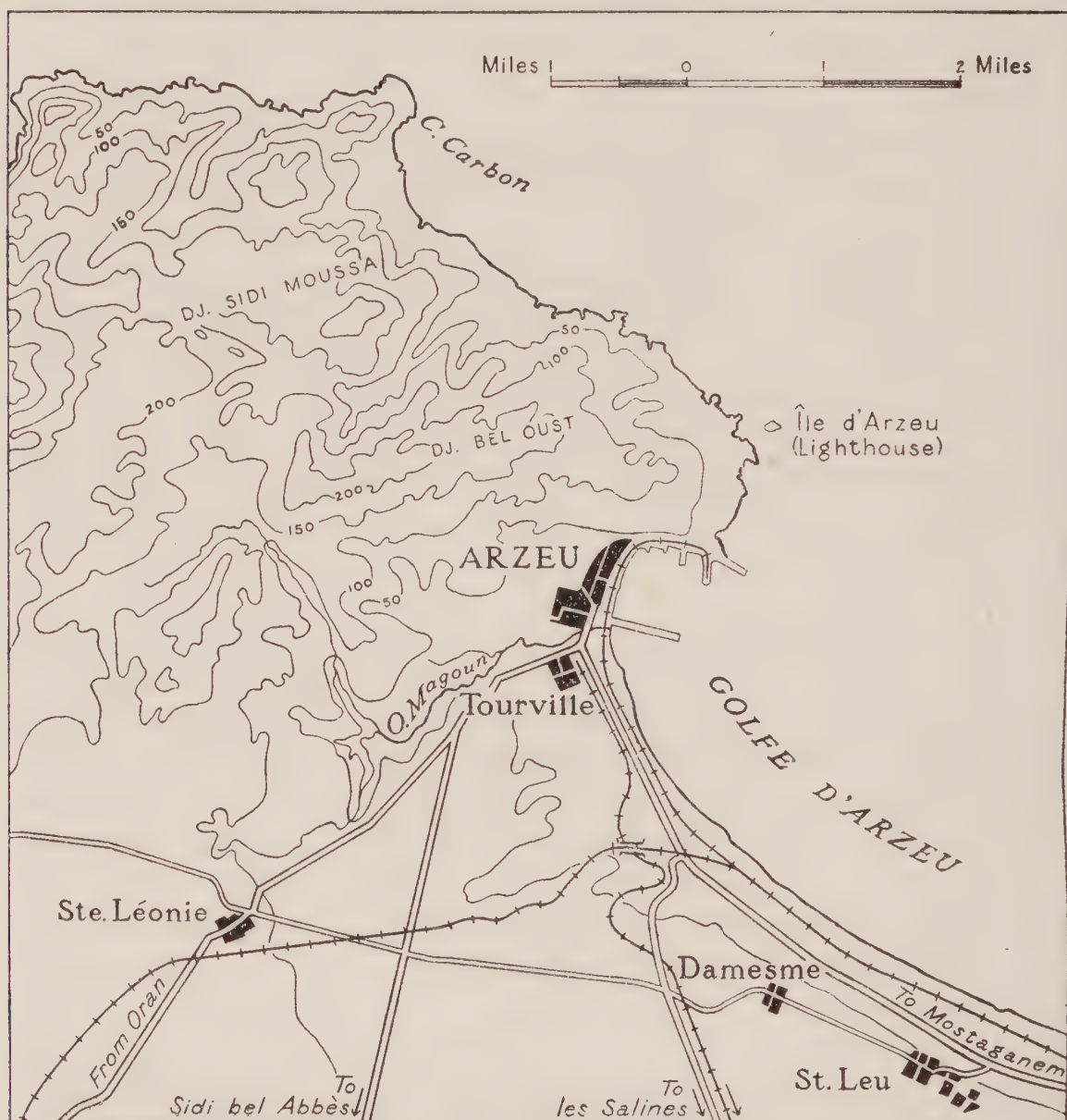


FIG. 27. *The geographical setting of Arzeu (Arzew). Heights are in metres*

Jetée Est there are three moles: the largest of these, No. 3, is served by the railway, as is the Grand Quai. The depth alongside these quays varies from 17 to 26 feet.

The Jetée Sud has been built in recent years in an east-north-easterly direction from a position between the town and the mouth of the Oued Magoun. It is about 3,080 feet long, with depths alongside of 26 feet.

The entrance to the harbour between the heads of the Jetée Sud and the extension of the Jetée Est faces south and is 885 feet wide, with a minimum depth of 26 feet.

Facilities. These include two small tugs, about twenty lighters, and numerous fishing and other small craft. There are medium-sized cranes on the quay, and two floating derricks of 7 and 10 tons. A tank

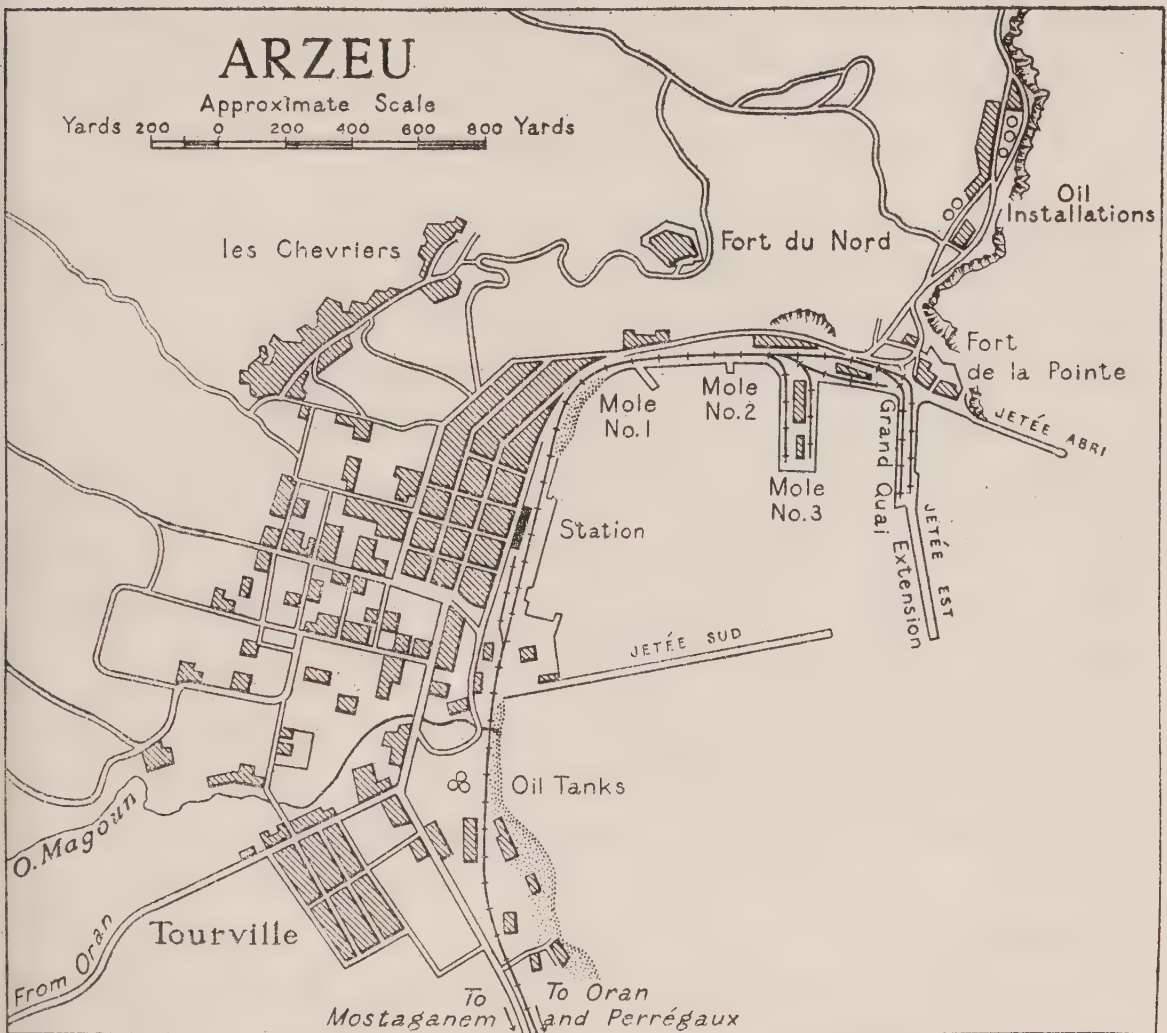


FIG. 28. *Arzeu (Arzew)*

for oil fuel is being built on the Grand Quai. Water is available at the quays. Only very small stocks of coal are normally maintained. There are three oil installations with a capacity of over 26,100 cubic yards (20,000 cu. metres) (p. 441). Pilots are available.

The south-western corner of the harbour (shown in Vol. I, Photo. 36) is used as a seaplane station, where considerable improvements were begun shortly before the war (p. 423).

Communications

Rail: There are narrow-gauge lines leading west from Arzeu to

Oran and east to Mostaganem. From la Macta on the latter line there is a line south to Colomb Béchar and Kenadza, crossing the main Oran–Algiers line at Perrégaux. A short narrow-gauge mineral line leads south from Arzeu to the salt deposits at les Salines (el Mellaha).

Road: The main road connexions are by Routes Nationales west to Oran, south-west to Ste. Barbe du Tlélat and Sidi bel Abbès, and east to Mostaganem, with a secondary road south to St. Denis du Sig across the low-lying plain of the Sig. There are no roads or even tracks into the difficult mountainous country to the north-west of the town.

PORT AUX POULES. Lat. $35^{\circ} 48' N.$, long. $0^{\circ} 08' W.$ Population 852 (558 Europeans). Chief town of a commune de plein exercice. Electricity (3-phase, 120/210). Hotels (5). Garage.

Port aux Poules is a sea-side resort and minor port at the head of the Golfe d'Arzeu between Arzeu and Mostaganem. It stands at the western end of the shallow bight into which flows the Oued Macta (the combined estuary of the Oueds Sig and Habra). The Macta nearly reaches the sea $2\frac{1}{2}$ miles east of Port aux Poules, but then turns west to flow parallel to the shore as far as Port aux Poules, leaving a sandy peninsula about 300 yards wide: the sandy beach on the seaward side of this spit is known as the Plage de la Macta. The port affords no shelter and is used only occasionally by small coasting vessels. Port aux Poules should not be confused with the place of the same name on the coast between Algiers and Dellys (Vol. I, pp. 97, 101).

Communications

Rail: Port aux Poules has a station on the narrow-gauge line from Arzeu to Mostaganem.

Road: The coastal Route Nationale from Arzeu to Mostaganem passes through Port aux Poules.

MOSTAGANEM (MOSTAGHANEM) (Figs. 29, 30, Photo. 22; Vol. I, Photo. 37). Lat. $35^{\circ} 56' N.$, long. $0^{\circ} 05' E.$ Population 38,555 (18,150 Europeans). Altitude 343 feet. Chief town of an arrondissement and a commune de plein exercice. Brigade de gendarmerie. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 115/210). Gas. Drainage. Hospital. Fire brigade. Hotels (13). Garages (18).

Mostaganem is on the eastern side of the Golfe d'Arzeu about

20 miles east-north-east of the port of Arzeu, and is in the centre of the straight coast between Pointe de la Salamandre (to the south) and Pointe Karouba (to the north). This coast offers little shelter, and the harbour, which lies immediately to the south of the Ain Sefra stream, is artificial. The town is on the edge of a plateau drained to the sea by several swift-flowing brackish streams. The largest of these is the Ain Sefra, the deep ravine of which separates the European town from the old town and the native quarter of Tidjit (Tingdit).

History

In Roman times Mostaganem was a seaport, which suffered from a violent earthquake affecting all western Algeria in the reign of the Emperor Gallien (260–268). The present town is believed to date from the time of the Almoravid Youssef ben Tachfine (1061–1106), who built the citadel, the Bordj el Mehal, now used as a prison. The town then belonged in turn to the Zianids of Tlemcen and the Merinids of Fes, before passing into Turkish hands in 1576. It was considerably enlarged and fortified by the corsair Khair ed Din, and during the sixteenth century became an important commercial centre with a population of about 40,000. It was taken by the French under General Desmichels in 1833 to prevent it falling into the hands of Abd el Kader, though until 1840 it continued to be governed by a native bey. The first battalion of *tirailleurs* or *turcos* was raised in Mostaganem in 1847 by General Lamoricière, and the town remains their headquarters: their spacious barracks are to the west of the European town.

Description of Town

The old town (Quartier Matemore) is built on a spur of high ground, mostly on the right bank (east side) of a meander of the Ain Sefra. It centres on the Place Dupuytren, which is surrounded by the Law Courts, the military hospital, and various schools.

The European town stretches west and south-west of the Quartier Matemore towards the port. The administrative and commercial centre is the large square near the southernmost bridge crossing the Ain Sefra to the old town; it includes the Town Hall and the post office, with large public gardens and, to the west, extensive barracks (Quartier d'Infanterie). The streets in this quarter are straight and generally intersect at right angles.

The native village of Tidjit is on the right bank of the gorge of the

Ain Sefra, to the north of the Quartier Matemore. It is compact and picturesque with several koubbas, or tombs, of local saints.

Industry and Commerce

In Tidjit there are a number of indigenous industries (mainly carpets and embroidery). Elsewhere there are several modern factories, some of which obtain power from the Ain Sefra. Manu-

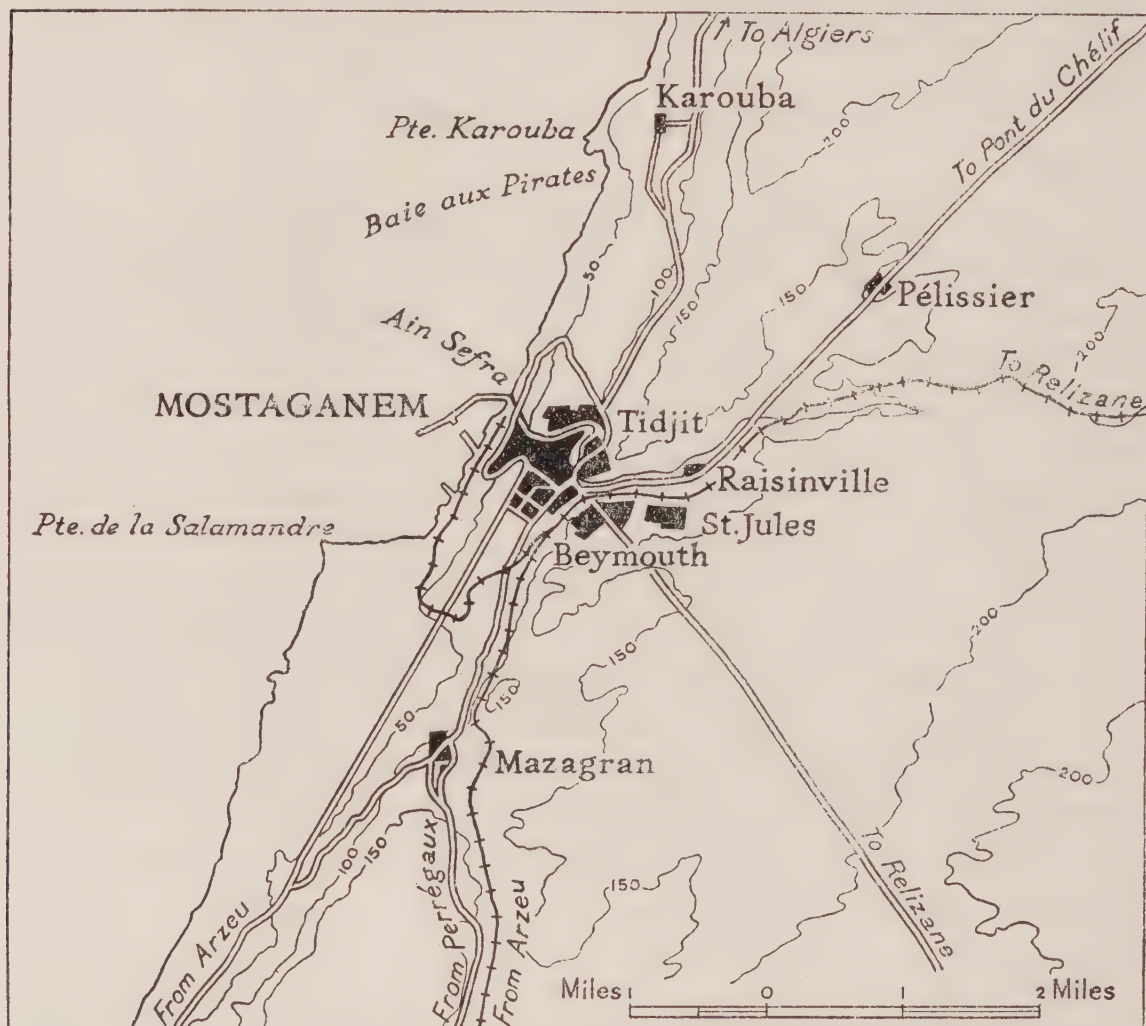


FIG. 29. *The geographical setting of Mostaganem (Mostaghanem). Heights are in metres*

factures include furniture, sandals, macaroni, spaghetti, and chemicals. Fishing is a relatively small industry, although Mostaganem is the fourth fishing-port in western Algeria, 1,034 tons (mainly sardines and allaches) being landed in 1936. The surrounding district is an important producer of early vegetables, wine, citrus and other fruits, and cereals. The port also serves the wine-producing area around Relizane, the cereal-growing districts of Tiaret and the Sersou, and the fertile plateaux of the Dahra. The main imports are coal, cement, foodstuffs, and machinery, and the principal exports wine and cereals,

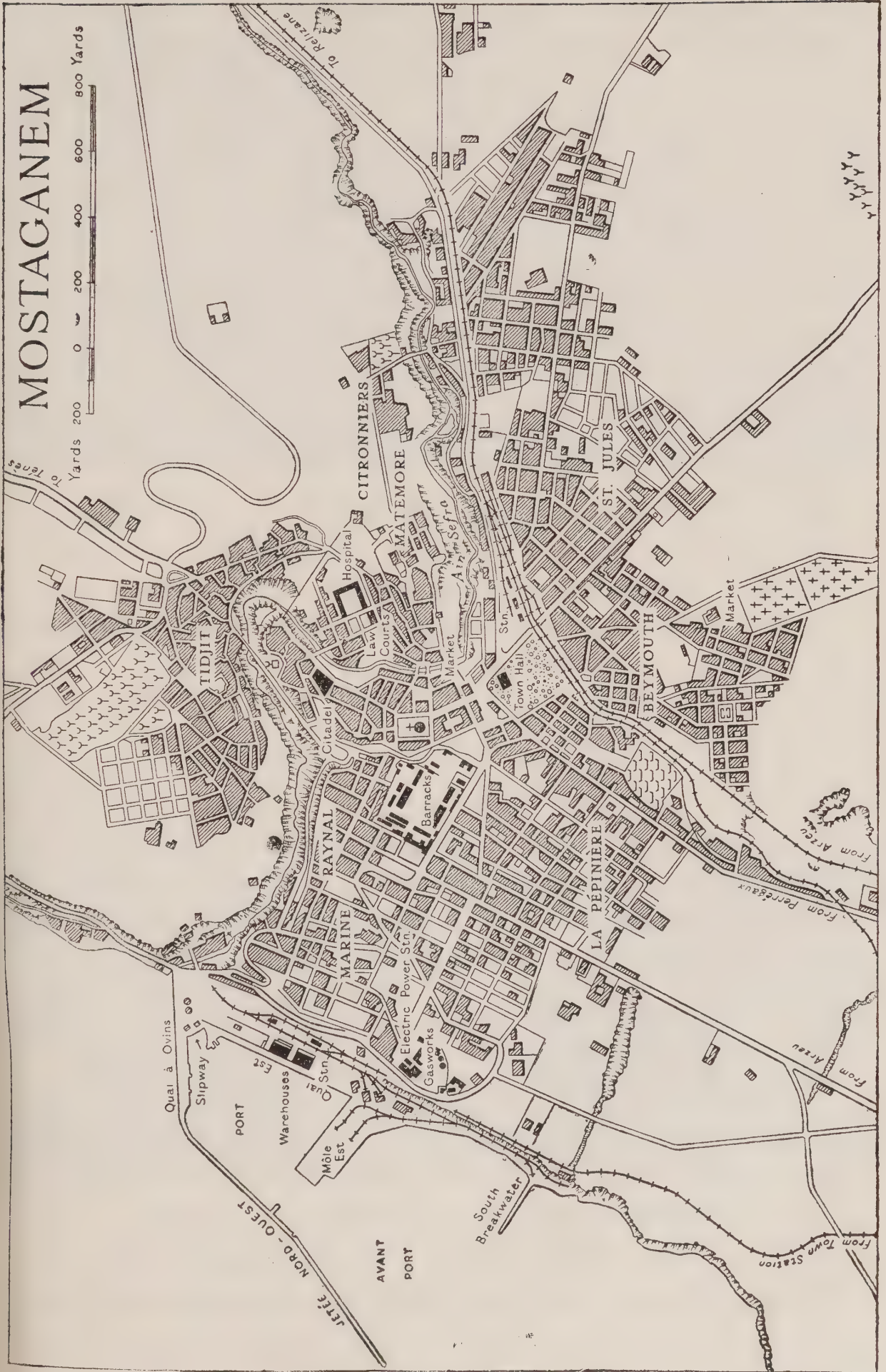


FIG. 39. Mostaganem (Mostaganem)

with small quantities of diatomite or kieselguhr (p. 251). The export trade is usually much greater than the import, as shown below:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	801	1,088,141	105,895	251,807
1938	1,076	1,518,257	161,861	340,059

Description of Port

The harbour is sheltered from the north and west by the Jetée Nord-Ouest, which extends westward and then south-westward for more than 3,000 feet from a point near the mouth of the Ain Sefra. Within this breakwater are two harbours, the Outer (Avant Port) and the Inner (Port).

The Avant Port is exposed to winds from the south-west and south, but is sheltered from the west by the outer portion of the Jetée Nord-Ouest, which was in course of construction in 1939 and was still incomplete at the time of the Allied landings in Algeria in November 1942. On the north-eastern side of the harbour is the Môle Est, which was also unfinished in 1942; on the southern side a breakwater, about 650 feet long, was being constructed about 500 yards south of, and roughly parallel to, the Môle Est. There are no quays in the Avant Port. Depths vary from about 10 feet in the east to 36 feet near the Jetée Nord-Ouest.

The port is protected by the Môle Est extending north-west from the shore: its entrance between this mole and a short spur projecting from the Jetée Nord-Ouest is 430 feet wide, and the general depth in the harbour since dredging operations in 1940 is 26 feet. The Quai à Ovins, on the north side, is 750 feet long and has a spur berth for the accommodation of one large ship. The Quai Est, on the east, is 1,420 feet long, and, besides a bitumen-storage installation, has extensive stacking areas and two large warehouses, behind which is the Gare Maritime. On the south, the northern side of the Môle Est is quayed and is 910 feet long. Ships also moor stern-on to the eastern side of the Jetée Nord-Ouest.

Facilities. There are two cranes, both of 5 tons (one floating). The harbour craft includes about fifty lighters, seven tugs, and numerous small fishing-vessels. There is one slipway at the root of the Jetée Nord-Ouest for craft up to 60 feet in length.

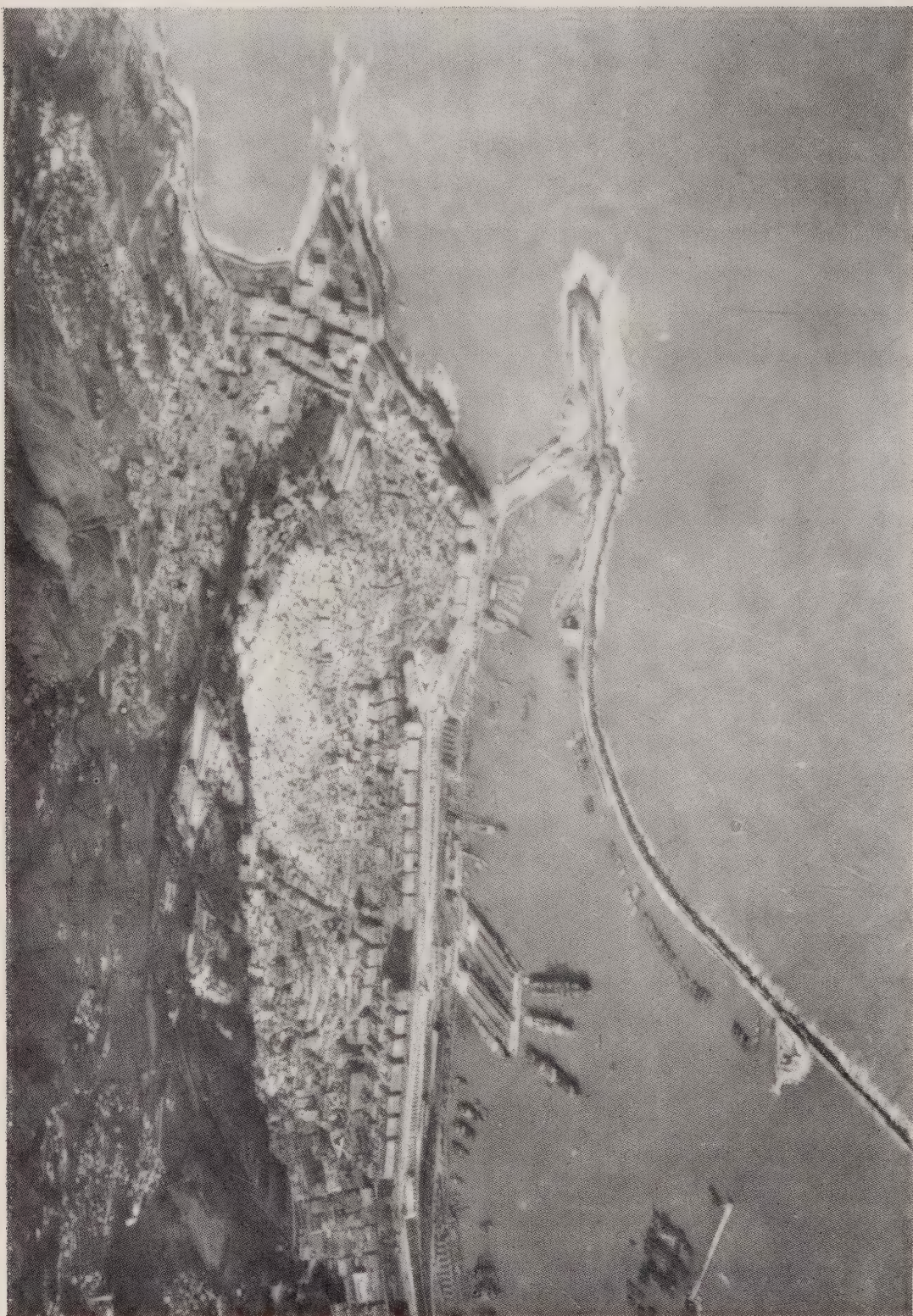
Water is laid on to the northern end of the Jetée Nord-Ouest and can be supplied to ship by water-boats. A small stock of coal (1,500–2,000 tons) is usually maintained, and there are various small supplies



21. *Ténès (town) from the east*



22. *Mostaganem: stacking space at the northern end of the Quai Est*



23. *Algiers from the east*

of oil (p. 441), but no installation for the bulk storage of fuel oil. There are gasworks and a thermal electric power-station in the town.

Communications

Rail: Two narrow-gauge lines link Mostaganem west to Arzeu and Oran and east to the Oran-Algiers railway at Relizane. Beyond Relizane the narrow-gauge line continues to Tiaret and Burdeau. There are two stations, Mostaganem Ville in the town and the Gare Maritime (Mostaganem Marine) near the port.

Road: Routes Nationales lead west along the coast to Arzeu and Oran, east to Ténès and Algiers, and inland to Perrégaux and Relizane.

TÉNÈS (TENEZ) (Fig. 31, Photo. 21; Vol. I, Photo. 38). Lat. $36^{\circ} 31' N.$, long. $1^{\circ} 19' E.$ Population, urban 2,236 (1,087 Europeans); commune 8,304 (1,576 Europeans). Altitude 130 feet. Chief town of a commune de plein exercice and a commune mixte. Electricity (3-phase, 115/200). Hospital (military). Meteorological station. Hotels (7). Garages (3).

Ténès is a small port, occupying the best position for a harbour in the 180-mile stretch of inhospitable coast between Arzeu and Algiers. The modern town has been built on a rocky plateau between 100 and 150 feet above sea-level, overlooking the estuary of the Oued Allalah. The old town (Vieux Ténès) is about 1 mile to the south-east in a fine defensive site on the plateau, surrounded on three sides by the narrow, steep-sided valley of the Allalah. The harbour is 1 mile north-east of the new town and $1\frac{3}{4}$ miles to the south-west of Cap Ténès, from which it is separated by steep cliffs. It is well sheltered from easterly winds by the cape, but is fully exposed to winds from the north and west. At one time Ténès was the main outlet of the Orléansville section of the Chélif valley, but it lost much of its trade when the railway from Algiers to Oran through Orléansville was completed. The line from Ténès to Orléansville was built only after the War of 1914-1918, and in recent years has been closed to traffic, so that the trade of the port, as shown below, is only small.

History

The modern town occupies the site of the Phoenician, and then Roman, colony of Cartenna, where the Emperor Augustus established a settlement of veterans. Parts of the ramparts and some tombs and cisterns remain: the latter are still in use. Abd el Kader tried

unsuccessfully to revive the port, but in 1843 the town was occupied by Marshal Bugeaud, who subsequently enlarged it and linked it to the new settlement at Orléansville.

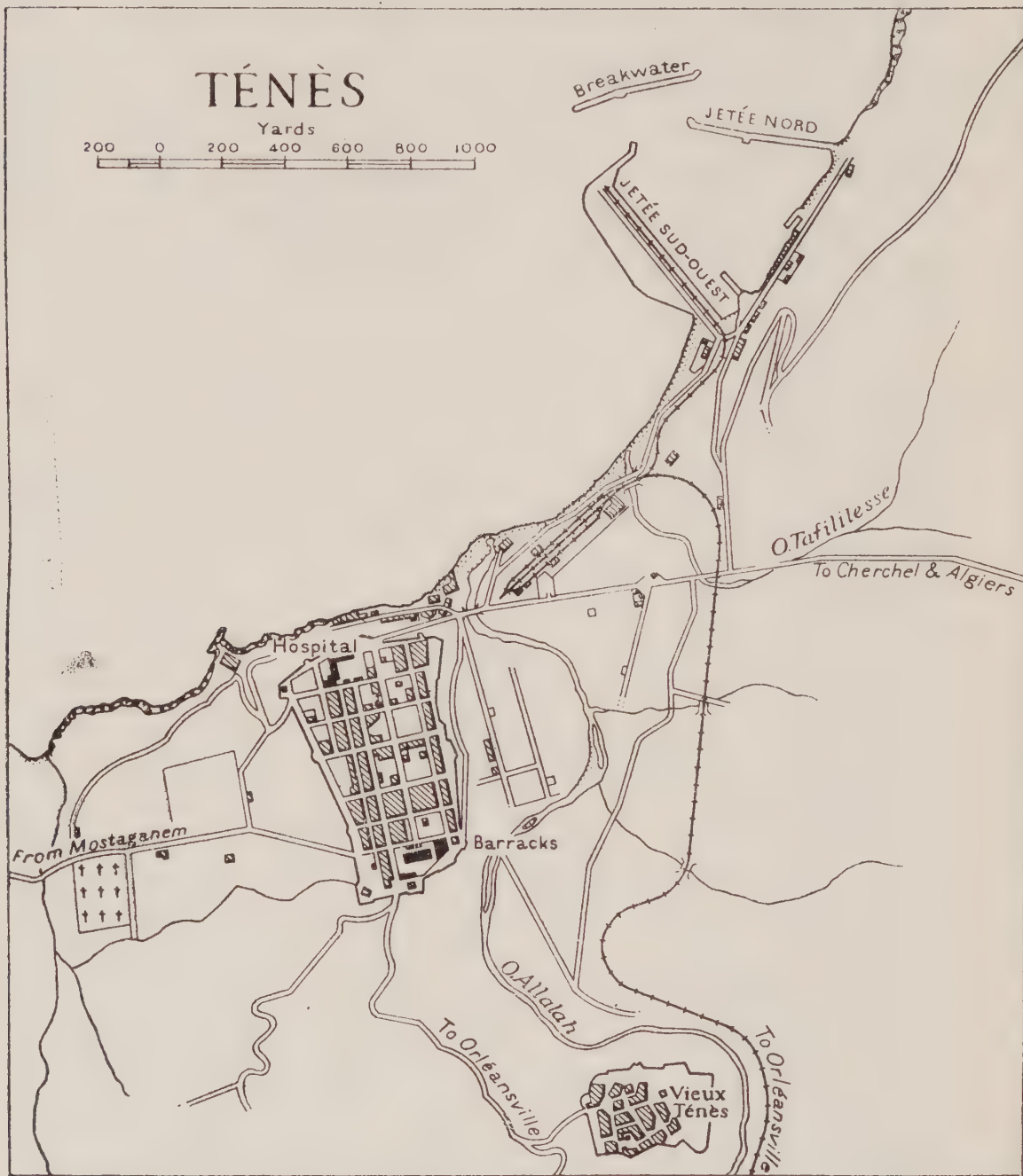


FIG. 31. *Ténès (Tenez)*

Vieux Ténès is said to have been founded by colonists from Elvira and Murcia in Spain in A.D. 875. It belonged to the rulers of Tlemcen from 1299 until its capture by Khair ed Din in 1517. The town retains its native character, and there are various Berber remains, including a monumental gate, a bridge, and a mosque.

Industry and Commerce

The only local industries are fish-canning and the making of mineral waters. The trade of the port is small owing to the difficulties of communication and the limited area of the Dahra served. Most of the trade is coastal, mainly with Algiers and Bône. The figures for 1937 and 1938 were as follows:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	164	63,986	7,047	15,301
1938	228	132,723	10,556	35,460

Description of Port

The harbour is formed by two jetties, the Jetée Nord and the Jetée Sud-Ouest: the entrance, facing north-north-west, is about 450 feet wide and is sheltered by a detached breakwater, 400 feet away. The port is available for vessels drawing 21 feet and up to 393 feet in length, though entry is dangerous in heavy weather. The main quay (the south-western) is 1,640 feet long and has depths alongside of 15 to 24 feet. Unloading can be carried out easily, though only with ship's appliances. This quay has open storage space of about 10 acres and a polygonal silo, 137 feet high, and is linked to the railway. A short distance to the north-east is a landing-place, 230 feet long, which is used exclusively by fishing-vessels.

Facilities. Ténès is poorly equipped as a port. Water (supplied from wells) is laid on to the south-western quay, but provisions are generally scarce and only small stocks of coal are maintained.

Communications

Rail: The narrow-gauge line from the south-western quay passing through the town to Orléansville on the main line from Algiers to Oran has been closed to traffic in recent years.

Road: Ténès stands on the Route Nationale along the coast from Oran and Mostaganem to Cherchel and Algiers. The best road inland is the Route Nationale along the valley of the Oued Allalah through Montenotte to Orléansville.

PORT BREIRA. Lat. 36° 32' N., long. 1° 35' E.

Port Breira is an anchorage and ore loading-point on the eastern side of the Baie des Beni Haoua (Hauas), near the mouth of the Oued Outar, about 15 miles east of Ténès. The bay has a clean sandy beach with the modern village of Francis Garnier (population 218, including

108 Europeans) at its head. Breira lies in the lee of the Îlot de Sidi Djilano (Sidi el Jilano), an islet joined to the mainland by a foot-bridge; on it is an electric transporter with a capacity of 650 tons per hour for the loading of iron ore. The port was formerly owned by the Société des Mines de fer de Breira et Beni Aquil, but now belongs to the Société minière de Miliana. The ore is brought from Beni Aquil to the coast by means of a gravity-operated cableway, about 6 miles long, with a capacity of 30 tons per hour, and is shipped in small coasting vessels (p. 239). The anchorage affords good shelter from easterly winds and has two mooring buoys. In the past there has been an annual production and export of from 40,000 to 70,000 tons of ore, but the port is now disused.

Communications

Road: The only connexions are by the Route Nationale along the coast west to Ténès and Mostaganem, and east to Dupleix, Cherchel, and Algiers.

DUPLEIX. Lat. $36^{\circ} 33' N.$, long. $1^{\circ} 42' E.$ Hotels (2).

Dupleix (formerly Oued Damous) is a small, regularly built European colony in the eastern Dahra, situated on the coast about half a mile east of the mouth of the Oued Damous. It has a very small coasting trade, averaging about 40 tons per annum, mainly with Algiers. Markets are held on Wednesdays and Saturdays.

Communications

Road: The coastal Route Nationale leads west to Port Breira and Ténès and east to Gouraya and Cherchel. A road leads south for 5 miles along the gap in the mountains formed by the Oued Damous, and is continued by a track to the Chélif valley at les Attafs. The track is now being made into a road throughout.

GOURAYA. Lat. $36^{\circ} 34' N.$, long. $1^{\circ} 54' E.$ Population, urban 708 (206 Europeans); commune 5,993 (250 Europeans). Altitude 66 feet. Chief town of a commune de plein exercice. Drainage. Hospital. Hotels (2). Garage.

Gouraya is a small village on the coast about half a mile southwestward of Ras Taska and 17 miles west of Cherchel. Behind it rise the forested mountains which culminate in Djebel Gouraya (3,271 ft.), the home of the Kabylie-speaking Beni Menasser tribe. There are numerous iron-ore deposits in the district, two of which are worked.

The ore is brought by overhead cableways to two loading-points—the Chargeur de Gouraya, near Cap Larès, 3 miles west of Gouraya village, and the Chargeur de Larhat, nearly a mile farther westward. At Gouraya there is a small wharf, alongside which small vessels with local knowledge can secure.

Communications

Road: Gouraya is on the Route Nationale from Ténès and Dupleix to Cherchel and Algiers.

CHERCHEL (SHERSHEL) (Fig. 32; Vol. I, Fig. 29). Lat. $36^{\circ} 37' N.$, long. $2^{\circ} 11' E.$ Population, urban 6,799 (1,207 Europeans); commune 12,225 (2,031 Europeans). Altitude 39 feet. Chief town of a commune de plein exercice and a commune mixte. Electricity (3-phase, 115/200). Drainage. Hospitals (1 civil, 1 military). Fire brigade. Hotels (4). Garages (2).

Cherchel is a compact town with a small port on its northern side lying at the foot of the outlying hills of the Massif de Miliana, which rise steeply from the sea and are covered with luxuriant vegetation. The port has been built between the Îlot Joinville and the coast on the site of a Roman naval harbour: the Roman commercial harbour lay farther to the east.

History

The site of Cherchel was occupied first by the Phoenician colony of Iol, founded in the fourth century B.C., and later by the Roman settlement of Caesarea. The latter became a colony in A.D. 40 and the capital of the province of Mauretania Caesariensis stretching from the Oued Moulouya in the west to Sétif in the east. The town covered an area 1 mile by $1\frac{1}{2}$ miles, and its population probably exceeded 100,000. There has been extensive destruction of the Roman antiquities, many having been pulled down for the sake of their stone, but enough ruins of walls, baths, and amphitheatres remain to show the former size and magnificence of Caesarea. Many of the remains are preserved in the town museums, and the springs which supplied the Romans are still in use to-day. Since Roman times Cherchel has changed hands frequently. In A.D. 372 it was destroyed by the Vandals, but under the Byzantines it regained some of its former importance. The Merinids seized the town in the fourteenth century, Andalusian refugees settled there in the following century, and Khair ed Din occupied it in 1520. In 1738 it was largely destroyed by an

earthquake. The plundering of a French wreck by the inhabitants in 1839 led to the occupation of the town by the French in the following year. Nearly all the buildings in the present town are modern, the only important Arab building being the Great Mosque, now used as a military hospital.

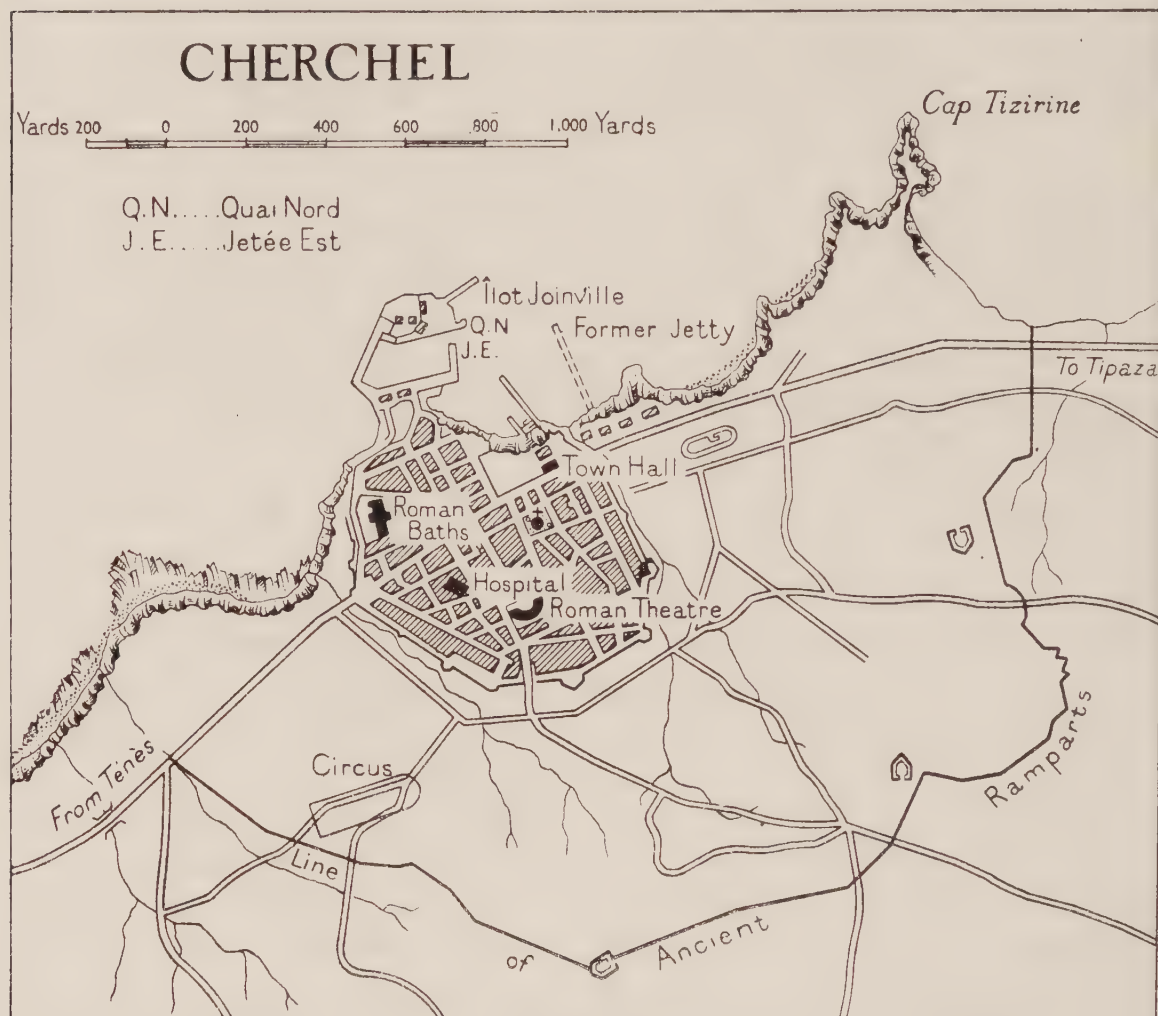


FIG. 32. *Cherchel (Shershel)*

Industry and Commerce

There are a few local industries, and a weekly market is held on Fridays. The town serves a limited district, and the trade of the port is only coastal and on a very small scale.

Description of Port

The harbour covers about 14 acres and affords excellent shelter in all weathers to small vessels drawing 9 to 12 feet, but entry and exit are impossible during bad weather. The entrance is between the Quai Nord and the head of the Jetée Est: it faces east and is 72 feet wide. There are other jetties outside the harbour to the east of the

Jetée Est. The Roman harbour was considerably larger, its eastern jetty being nearly a quarter of a mile to the east of the present harbour.

Facilities. Water is available at the quays, but the port offers few other facilities. There is a lighthouse on the Îlot Joinville.

Communications

Rail: The narrow-gauge railway which ran from the station in the north-east of the town to el Affroun on the Oran–Algiers main line has been closed for some years, but there is a normal-gauge line between Marengo and el Affroun.

Road: A Route Nationale leads west along the coast to Gouraya and Ténès. East of Cherchel it leaves the coast to skirt the southern edge of Djebel Chenoua. It reaches the sea again at Tipaza and continues through Castiglione to Algiers. From the Algiers road two roads lead south, one a difficult route across the Massif de Miliana to the Chélif valley, and the other, a Route Nationale, to Marengo, where there are branches to Miliana and Blida.

TIPAZA (TIPASA) (Fig. 33; Vol. I, Photo. 39). Lat. $36^{\circ} 36' N.$, long. $2^{\circ} 26' E.$ Population, urban 648 (425 Europeans); commune 4,653 (647 Europeans). Altitude 82 feet. Chief town of a commune de plein exercice. Electricity (3-phase, 110/190). Hotels (5). Garage.

Tipaza is on rising ground at the extreme western end of the hills of the Sahel of Algiers, and at the foot of Djebel Chenoua. It lies to the east of the Baie de Chenoua on the small Baie de Tipaza: the latter extends from Cap Tipaza (Ras el Kalia) in the west to Pointe de Sidi Said (Jezirat Sidi Said) in the east.

Tipaza is the Tipaza (Tipasa) of the Roman province of Mauretania Caesariensis, and should not be confused with the inland Tipasa of Numidia: the latter is now known as Tifech and is in the department of Constantine, about 55 miles south of Bône.

History

Tipaza was founded by the Phoenicians, but became a Roman military colony in the first century A.D. It was built on three small hills overlooking the sea—Ras ez Zarur to the east, Ras el Knissa to the west, and Ras bel Aishe in the centre. The old harbour was at the eastern end. The present harbour and village are in the centre, just within the ancient line of ramparts. The colony prospered, especially commercially, and at one time had more than 20,000 inhabitants. Christianity was introduced at an early date, and Tipaza

became a bishop's see in the third century. It was a centre of religious controversy in the great heresies, and when the Vandal King Huneric appointed an Arian bishop to Tipaza in 484, many of the Catholic inhabitants went into exile in Spain. Those remaining were cruelly persecuted, and had their tongues and right hands cut off, although, according to tradition, they were still miraculously able to talk. Tipaza then disappears from history: its ruin may have been caused by the Arabs, who do not appear to have made any settlement here.

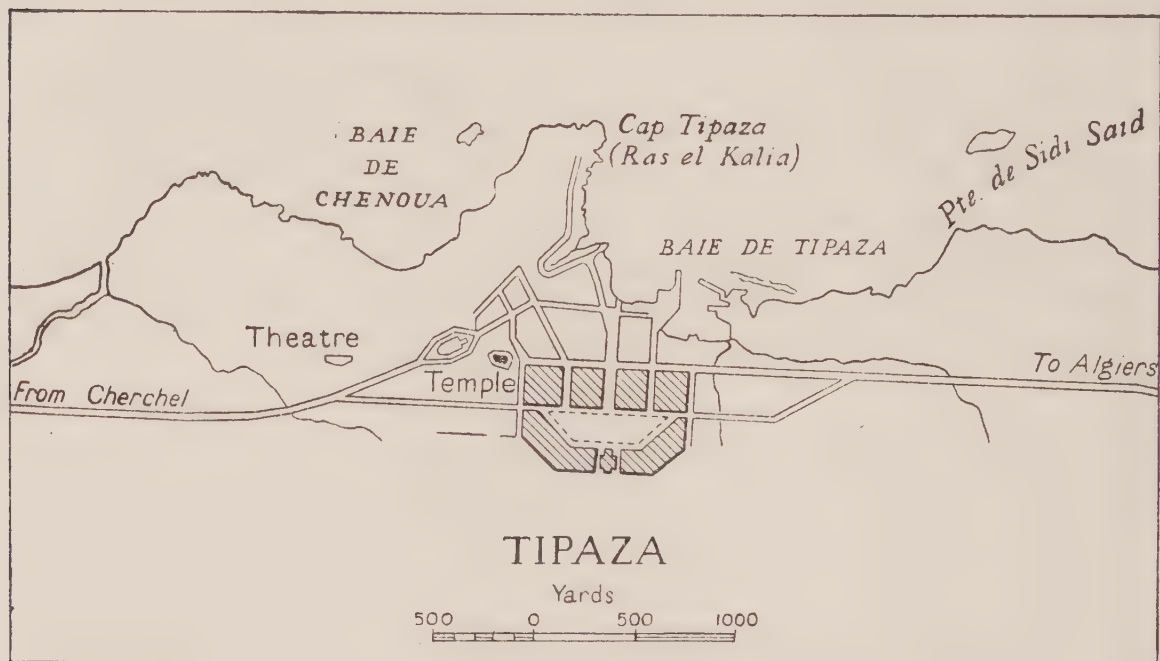


FIG. 33. *Tipaza (Tipasa)*

Many ruins remain, though they are mostly in a poor state. They include parts of the wall, which was 2,400 yards long, three churches, the baths, the theatre, and the amphitheatre. The basilica of St. Salsa is on the eastern hill surrounded by a large cemetery, and the Basilica Alexander and the Great Basilica are on the western hill. The last is in a very bad condition, having served for centuries as a quarry, though the plan of the building is still recognizable.

Industry and Commerce

There are no industries and only a small coastal trade. A market is held on Sundays.

Description of Port

The harbour, formed by two short moles, is exposed to north-west, north, north-east, and east winds, and affords only poor shelter from westerly winds. The landing mole extending northward from the

shore has depths of about 8 feet on its eastern side; in summer even light onshore breezes make landing difficult, and sometimes impossible. There are few facilities.

Communications

Road: There are connexions west to Cherchel either along the southern edge of Djebel Chenoua (Route Nationale) or along the coast (secondary road): the former has an important branch to Marengo and the Chélif valley. The Route Nationale continues east to Algiers.

CASTIGLIONE. Lat. $36^{\circ} 39' N.$, long. $2^{\circ} 42' E.$ Population, urban 2,225 (1,831 Europeans); commune 4,094 (2,006 Europeans). Altitude 246 feet. Chief town of a commune de plein exercice. Electricity (3-phase, 110/190). Drainage. Meteorological station. Hotels (4). Garages (2).

Castiglione, formerly known as Bou Ismail, is a small health resort on the coast between Tipaza and Algiers. It has a sandy beach and a small harbour mainly used by Italian fishermen. The town has many summer villas and several avenues well shaded by mulberry trees. Most of the houses are about half a mile inland, along the Oran-Algiers coastal road. A market is held daily in the town. About a mile from the town are the ruins of a Roman settlement, the identity of which is unknown, together with the remains of a Christian church and cemetery of the fifth century. To the south-west are two small harbours, each protected by two jetties and used by small fishing-boats, at Chifalo or Tefeschoun Marine ($1\frac{1}{4}$ miles from Castiglione) and Bou Aroun ($2\frac{1}{2}$ miles). Chifalo is inhabited mainly by Sicilian fishermen and is named after the small Sicilian port of Cefalu, from which they came.

Communications

Rail: The tramway from Algiers to Castiglione with a branch at Mazafran to Koléa has been closed for some years and is now partially dismantled.

Road: The coastal Route Nationale from Tipaza to Algiers passes through Castiglione. There is also a secondary road leading inland to Koléa and Blida.

ALGIERS (ALGER) (Figs. 34, 35; Photos. 1, 16, 23-27, 59, 104-108; Vol. I, Photos. 5, 40). Lat. $36^{\circ} 47' N.$, long. $3^{\circ} 04' E.$ Population 264,232 (182,503 Europeans): with suburbs of Birmandreis, Bouzarea,

el Biar, Hussein Dey, Kouba, Maison Carrée, and St. Eugène, 367,093 (240,533 Europeans). Chief town of a department, an arrondissement, two communes de plein exercice, and a military division. Headquarters of the Governor-General, Army, Navy, Air Force, Police, and fire services. Courts of Appeal, Assize, and First Instance.



FIG. 34. *The geographical setting of Algiers (Alger). Heights are in metres*

Electricity (3-phase, 115/200; monophase, 200). Drainage. Hospitals (5 civil, 1 military). University. Meteorological station. Wireless. Hotels (about 100). Garages (about 120).

Algiers is the capital of Algeria, the seat of the Governor-General, and the headquarters of the French administration and military forces in the country. As an administrative, commercial, and industrial centre it is outstanding not only in Algeria but in French North Africa, and its growth since the French occupation has been

continuous. The town has grown up on the western shore of the Baie d'Alger, which extends from Pointe Pescade to Cap Matifou, and is hemmed in between the sea and the hills of Djebel Bouzarea which slope northward to a maximum height of about 1,200 feet: on these hills are numerous forts overlooking the town. The original town with its Kasba or citadel developed on an area of rock which is separated from Djebel Bouzarea by the deep valley of the Bab el Oued. This site proved easy to defend and enabled the Barbary corsairs to use the town and adjacent port for about three centuries. The old town is now completely surrounded by modern French quarters, which have grown up on the steep slopes of the hills overlooking the bay. Many new suburbs have also been created and joined to the town in recent years, so that the built-up area now stretches for 10 miles from Pointe Pescade and St. Eugène in the north-west to Hussein Dey and Maison Carrée in the south-east. In addition the large and well-equipped port immediately east of the town has undergone much expansion and improvement, and is spreading south towards the suburb of Hussein Dey.

History

The Roman town of Icosium stood on the site of Algiers, but it was only a small settlement, the capital of Roman North Africa being Caesarea (Cherchel) (p. 147). Later the town fell into ruins and became the home of the Berber tribe of the Beni Mezranna. The present city was founded in 944 by Bulukkin, who called it el Djezair Beni Mezranna ('the islands of the Beni Mezranna'). The name Alger (Spanish Argel) is a corruption of el Djezair. These islands, which have disappeared in the subsequent development of the port, attracted the Arabs because of their defensive possibilities and because of the good natural roadstead which they sheltered. During the eleventh century the town and port flourished, and though later it belonged in turn to all the Berber dynasties (Vol. I, Chap. VII), it enjoyed a large measure of independence. The Spanish occupied the Peñon, the islet in front of the harbour (near the Îlot de la Marine) as early as 1302, but did not fortify it until 1510, after the occupation of Oran and other Algerian towns. In 1516 the inhabitants appealed to the Turkish brothers, Aroudj and Khair ed Din (Barbarossa), to expel the Spanish: Aroudj, the elder, established himself in the town but failed to drive the Spanish from the Peñon, but this was accomplished in 1530 by Khair ed Din, who also began the building of the port by linking the Peñon to the mainland with a mole (now known as the

Jetée Khair ed Din). From this time until the French occupation in 1830 Algiers became the chief centre of the Barbary corsairs, despite repeated attempts by various European nations to subdue them. In 1541 the Emperor Charles V tried to capture the city with sixty-five warships, 451 other vessels, 12,300 seamen, and 22,000 soldiers, but a storm destroyed the bulk of his fleet, and his army was heavily defeated. Between 1628 and 1634 the corsairs captured eighty French ships and took 1,300 prisoners. The French fleet bombarded the port in 1661, 1682, 1688, and on various other occasions. There was a Danish expedition in 1770 and a Spanish expedition five years later. In 1816 Algiers was bombarded by a British squadron under Lord Exmouth, assisted by Dutch men-of-war, and the corsair fleet was burned. Piracy was renewed, however, and continued until the French expedition of 1830 under General Bourmont and Admiral Duperré. On 14 June, 37,000 men with 4,000 horses were landed at Sidi Ferruch, 15 miles west of Algiers, and on 19 June won the battle of Staouéli. The city of Algiers was attacked on 4 July and capitulated on the following day. Algiers was from the first the main centre of the French in north Africa and has remained the commercial and cultural capital of Barbary. Its continuous development since the French occupation is illustrated by the great increase in population (Fig. 8). The city with its suburbs is easily the largest urban area in French North Africa, although the strictly 'municipal' population of Casablanca (257,430), according to the 1936 census, slightly exceeded the municipal population of Algiers (252,321).

Description of Town

The main thoroughfare of Algiers is a road following the line of the coast, and is at sea-level in the south-east of the town, but at a considerable elevation in the north. Inland there are other main roads following the same contours from north to south: they rise in tiers, the different levels being connected by steep or zigzag streets or by flights of steps.

The old Turkish town, a triangular-shaped area surrounding the Kasba, is the home of most of the native population, although in recent years another native quarter has grown up in Belcourt (south-west of the Bassin de Mustapha). The site of the old walls is marked by the Boulevard de Verdun on the north and the Boulevard de Gambetta on the south. The lower part of the old town, adjacent to the port, has changed considerably in recent years, but the district

surrounding the Rues Marengo and Randon has retained its original character. It is a squalid maze of narrow alleys, which are neither level nor straight and often rise and fall very rapidly. Native craftsmen do their work here exactly as they did before the French occupation. The buildings include the Great Mosque (Djama el Kebir), the oldest mosque, dating from the eleventh century, and the mosques of la Pêcherie (Djama el Djedid), Sidi Ramdane, and Sidi Abd er Rahman, and the Tsalibia medersa. The Kasba was built by the Turks between 1516 and 1590, replacing an older Berber fortress: it stands at a height of 387 feet above sea-level and is now used as a barracks.

The original French quarter lay between the old town and the sea-front and centred on the Place du Gouvernement: until 1900 it was walled and extended only as far as the present Boulevard Guillemain in the north and the Boulevard Laferrière in the south. Beyond the walls lay the various quarters of Bab el Oued (an industrial district with many Jewish and Spanish inhabitants) and St. Eugène (a sea-side resort) to the north, and Plateau Saulière and Mustapha (residential areas) to the south. In recent years there has been considerable expansion into the hills, notably into Mustapha Supérieur, and along the shore to the south-east, where the industrial districts of Belcourt, Hamma, and Hussein Dey have grown up. Many of the older buildings have been replaced in recent years by modern concrete structures, particularly the government and municipal offices and shops. There has also been a large slum-clearance scheme in the district west of the Darse de l'Amirauté: the displaced workers (mainly dock labourers of Neapolitan origin) have been rehoused in flats along the Rue Sadi Carnot.

In recent years the centre of gravity has moved south from the Place du Gouvernement to the Boulevard Laferrière, where the great 300-foot high concrete building of the Government-General has been erected. Here are centred almost all the government offices except for certain departments outside the Governor-General's domain, housed elsewhere in the town. The Boulevard Laferrière cuts at right angles most of the principal north-south streets of the city. The Rue d'Isly and the Rue de Constantine are both busy shopping centres with many public buildings including the Opera House, the Law Courts, and the Palais des Assemblées: the former street is continued by the Rue de la Lyre, a street of Jewish shops, and the latter leads to the Square Aristide Briand, the centre of the commercial and banking quarter. To the south of the Boulevard

Laferrière the Rue d'Isly continues as the Rue Michelet, which is lined with shops and houses and winds its way up to Mustapha Supérieur. The Rue de Constantine continues the sea-front thoroughfare as the Boulevard Baudin and, beyond the Carrefour de l'Agha, as the Rue Sadi Carnot, which leads south-east towards Hussein Dey and Maison Carrée.

The Jardin d'Essai is at Hamma to the south-east of the town. It has a famous collection of rare species, which was begun by the Government in 1832 and has been maintained ever since at great expense (cf. p. 195).

Work on the port began in 1836 and the first developments were completed by about 1850. A subsequent programme, whereby the Bassin de l'Agha was constructed, was carried through between 1897 and 1912. Further schemes for extensions to the south and south-east in the Bassin de Mustapha are still incomplete.

Industry and Commerce

Algiers is the leading industrial centre in the country. Most of the factories are at the south-eastern end of the urban area, especially in the suburbs of Hamma and Hussein Dey. Besides bakeries, breweries, and flour-mills there are large factories producing chemicals, superphosphate, and soap, numerous plants making barrels for the export of Algerian wines, tobacco factories, and a large well-equipped plant making tins for use in sardine canneries. The chief brickworks are in Maison Carrée and near el Biar, and at Pointe Pescade there is a large plant producing cement (45,000 tons per annum) and lime (15,000 tons). There are railway workshops at Hamma and two large and well-equipped engineering works besides numerous small workshops, at which most repairs can be effected: repairs can also be carried out at the graving docks (p. 158). The fishing industry is comparatively undeveloped (p. 258).

The trade of the port is large, as shown by the figures given below for the years 1937 and 1938. The export trade consists mainly of cereals, wine, olive-oil, esparto grass, sheep, iron ore, phosphates, and gypsum, together with coal, which is supplied to vessels. The chief imports are coal and coke, followed by manufactured goods, timber and building materials, chemicals, and foodstuffs.

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	4,068	8,844,743	1,810,777	1,862,013
1938	3,852	8,146,994	1,631,432	1,828,527

Algiers has excellent shipping services, especially with Marseilles and Port Vendres, and is the chief passenger port in the country, with 300,000 or more travellers per annum (pp. 421-422).

Algiers is one of the principal coaling stations in the Mediterranean, as described on pp. 116-117, supplying about 1,100,000 tons of fuel to vessels in a normal year. This figure has been exceeded by Oran on several occasions in recent years. The coaling trade is dominated by British firms.

Description of Port

The harbour is built in front of the main part of the town, which faces due east and, except for the shelter given by the Îlot de la Marine, is entirely artificial. It resembles an L in shape and has a frontage of nearly $2\frac{1}{2}$ miles. It is enclosed by the Jetée du Nord (and its extension the Jetée Pierre Watier) to the north-east and the Brise-Lames Est to the south-east with a detached zigzag breakwater (which changes its name at each leg) between the two. It has grown southward from the Îlot de la Marine, gradually and rather haphazardly, and consists of the small Darse de l'Amirauté in the north and three main basins—the Bassin du Vieux Port, the Bassin de l'Agha, and the still incomplete Bassin de Mustapha. Another extension, the Bassin de Hamma, is also projected to the south-east of the Bassin de Mustapha: it will cover about 148 acres.

There are two entrances to the harbour, both facing south-east—Passe Nord (531 ft. wide and 72 ft. deep) between a triangular projection of the Jetée du Nord known as the Musoir Nord and the northern extension of the Jetée de l'Est (the Musoir Sud), and the southern entrance (1,200 ft. wide and 54 ft. deep) between the head of the Brise-Lames Est and the Jetée de Mustapha.

Westerly winds raise, and easterly winds lower, the level of the water in the basins, the difference in the two levels being about 3 feet.

Darse de l'Amirauté (Photo. 25). This is the oldest part of the harbour. It is 480 feet long (from north to south) and 810 feet broad, with depths in it of from 6 to 20 feet. Its entrance between the head of the Môle Lyvois and the root of the Jetée du Nord is 420 feet wide and 21 feet deep. There is a triangular quay on its south-eastern side, to the north of which are some slipways built on the south-western side of the Îlot de la Marine. On the north is the Jetée Khair ed Din, behind which are the Admiralty offices. On the west side is an unnamed quay, with the Môle Lyvois to the south-west. The eastern part of the Darse is reserved for naval use, but the western part is

used by sports clubs and various small craft. As the town is on a much higher level than the port, the two are connected by ramps (Photo. 105).

Bassin du Vieux Port (Photo. 108). The Bassin du Vieux Port covers an irregularly shaped area about 1,600 yards long (from north to south) and 600 yards wide. Depths vary between 36 and 60 feet, but are not maintained close up to the quays. It is bounded on the north-east by the Jetée du Nord, which curves south-east from the Îlot de la Marine and continues outside the present limits of the harbour as the Jetée Pierre Watier, and on the south-east by the Jetée de l'Est. The northern entrance to the basin, the Passe Nord, is also the northern entrance to the harbour (p. 157).

The western side of the basin is quayed and has several projecting moles. In the north is the Môle Lyvois and the Môle de Pêche, which was built shortly before the war and has a large fish-market on it. About 300 yards to the south is the Môle Al Djefna (Photo. 26), on which stands the Gare Maritime. The Gare Centrale lies a short distance to the south-west, behind the Quai Bab Azoun, which extends from the Môle Al Djefna to the Môle des Passageurs; the building of the latter is not yet complete. Between this mole and the Môle Amiral Mouchez, which forms the southern limit of the Bassin du Vieux Port, there are some slipways and the two graving docks of a ship-repairing yard. The angle between the graving docks and the Môle Amiral Mouchez is used as a mooring ground for lighters.

The Quai à Charbon has been built on the harbour side of the Jetée de l'Est and is used as a coal dump.

The southern entrance to the basin, the Passe Mouchez, lies between the Quai de Bastia (the head of the Môle Amiral Mouchez) and a spur jetty extending westward from the southern end of the Jetée de l'Est: it is 192 feet wide and 33 feet deep.

Bassin de l'Agha. The Bassin de l'Agha is about 600 yards long (from north and south) and varies between 500 and 800 yards in width. Depths vary between 23 and 49 feet. It extends from the Quai de Biarritz (the south side of the Môle Amiral Mouchez) in the north to the Quai de Calais (the north side of the Grand Môle) in the south. Between the two is the Môle aux Minerais, which is used for loading ore and has a dump on it: it divides the basin into two, and is quayed on its northern and southern sides (Quai de Boulogne and Quai de Bordeaux respectively) and at its head (Quai de Bonifacio). The Quai de Bizerte connects the roots of the Môle Amiral Mouchez and the Môle aux Minerais, and the Quai de Brest



24. *Algiers: quayside south of the Gare Centrale (prior to the construction in right background of the Môle des Passageurs)*



25. *Algiers: Darse de l'Amirauté*



26. *Algiers: Môle Al Djefna and Quai Bab Azoun*



27. *Algiers: Quai de Dieppe*

extends from the Môle aux Minerais to the Grand Môle. The basin is enclosed on the east by the Jetée de l'Agha.

Bassin de Mustapha. The Bassin de Mustapha in the southern part of the harbour is the most recent of the basins and is not yet complete. It is about 1,300 yards long (from east to west) and varies in width between 200 and 1,000 yards, with depths of from 30 to 54 feet. It is bounded on the north-west by the Quai de Cette (the southern side of the Grand Môle) and on the north by the Jetée Butavand, which is a continuation of the Jetée de l'Agha and is itself continued outside the harbour for nearly 1,800 feet to the south-east by the Jetée de Mustapha.

Three small basins open off the Bassin de Mustapha. The first is 600 feet wide and 24 feet deep and lies between the Quai de Cette and the Quai de Dieppe. The latter quay has a small camber and a sea-plane base at its western end and a coal dump with three transporters at its eastern end (Photo. 27): the dump feeds the electric power station immediately south of the quay. The short Quai de Calvi is on the southern side of the camber. The second basin is 510 feet wide and 30 feet deep and is surrounded by quays—the Quai de Dunkerque on the west, the Quai de Dakar on the south, and the Quai de Fécamp on the east. The Quai de Fécamp is the western quay of the recently constructed Môle Louis Billiard, which forms the western limit of the third basin. This basin is 1,500 feet wide, extending to the Brise-Lames Est, which is also the south-eastern limit of the whole harbour. The southern end of this basin is being reclaimed, and the original proposals provided for the construction of a mole northward from the shore to divide the basin into two smaller basins. The Quai de Fort de France is the eastern side of the Môle Louis Billiard, and the Quai de Falaise forms its head. The Quai de Lorient is the western side of the Brise-Lames Est. The southern entrance to the Bassin de Mustapha lies between the heads of the Brise-Lames Est and the Jetée de Mustapha. It is also the southern entrance to the harbour, and faces south-east (p. 157).

Details of the principal quays are given in the following table:

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
DARSE DE L'AMIRAUTÉ	South-east quay	385	c. 5
	Jetée Khair ed Din	610	c. 5
	Môle Lyvois (north side)	220	c. 4
BASSIN DU VIEUX PORT	Môle Lyvois (south side)	210	c. 9
	Môle de Pêche (north side)	400	6-25
	Môle de Pêche (south side)	500	19-26
	Môle de Pêche (head)	134	26

PORTS

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
BASSIN DU VIEUX PORT (<i>cont.</i>)	Quay between Môle de Pêche and Môle Al Djefna	850	15-20
	Môle Al Djefna (north side)	700	15-32
	Môle Al Djefna (head)	450	33
	Môle Al Djefna (south side)	680	23-33
	Quai Bab Azoun	870	17-22
	Môle des Passageurs (north side)	1,010	17-46
	Môle des Passageurs (head)	420	46
	Môle des Passageurs (south side)	1,010	25-46
	Quay south of Môle des Passa- geurs	450	25
	Quay (north-south) east of graving docks	560	20-32
	Môle Amiral Mouchez (north side)	600	20-42
	Quai à Charbon	1,950	49-60
	Musoir Sud	350	30
	Musoir Sud (spur-jetty exten- sion)	520	9-60
	Jetée du Nord	c. 1,950	c. 10 along- side; 32 at 70 ft. off.
	Jetée Pierre Watier	c. 1,425	..
BASSIN DE L'AGHA	Môle Amiral Mouchez (Quai de Bastia)	420	39
	Môle Amiral Mouchez (Quai de Biarritz)	720	31
	Quai de Bizerte	640	29
	Môle aux Minerais (Quai de Boulogne)	920	28
	Môle aux Minerais (Quai de Bonifacio)	370	29
	Môle aux Minerais (Quai de Bordeaux)	1,000	27
	Quai de Brest	630	23
	Grand Môle (Quai de Calais)	1,800	23-31
	Grand Môle (north-east side)	460	31
BASSIN DE MUSTAPHA	Jetée de l'Agha	c. 2,000	c. 8 along- side; 32-49 at 80 ft. off.
	Grand Môle (south-east side)	460	27
	Grand Môle (Quai de Cette)	1,770	14-28
	Quai de Calvi	440	14-21
	Quai de Dieppe	1,000	18-24
	Quai de Dunkerque	790	22-24
	Quai de Dakar	560	24
	Quai de Fécamp	1,000	29-32
	Môle Louis Billiard (Quai de Falaise)	520	31
	Môle Louis Billiard (Quai de Fort de France)	1,500	26-31

1. Môle Lyvois
2. Môle de Pêche
3. Môle Al Djefna
4. Môle des Passageurs
5. Môle Amiral Mouchez
6. Môle aux Minerais
7. Grand Môle
8. Môle Louis Billiard
9. Quai Bab Azoun
10. Slipway
11. Graving docks
12. Quai à Charbon
13. Quai de Bastia
14. Quai de Biarritz
15. Quai de Bizerte
16. Quai de Boulogne
17. Quai de Bonifacio
18. Quai de Bordeaux
19. Quai de Brest
20. Quai de Calais
21. Quai de Cette
22. Quai de Calvi
23. Quai de Dieppe
24. Quai de Dunkerque
25. Quai de Dakar
26. Quai de Fécamp
27. Quai de Falaise
28. Quai de Fort de France
29. Quai de Lorient



FIG. 35. Algiers (Alger)

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
BASSIN DE MUSTAPHA (<i>cont.</i>)	Quay-face south-east of Môle Louis Billiard	550	c. 26
	Brise-Lames Est (Quai de Lorient)	2,240	30-46
	Jetée Butavand	c. 1,750	42
	Jetée de Mustapha (inside boom defence)	c. 950	14 alongside; over 30 at 50 ft. off.

Facilities. Algiers possesses excellent equipment and general facilities. Before the war it had between thirty-five and forty cranes of varying capacity: many of them are electrically operated, and the largest crane in the graving docks has a capacity of 20 tons. There are coal transporters on the Quai à Charbon and on the Quai de Dieppe (near the power station) and an ore transporter on the Môle aux Minerais. In addition there are some mobile petrol-electric cranes and about twenty floating cranes and sheerlegs.

The harbour craft normally include about sixteen tugs (including four sea-going vessels), three salvage craft, three water-boats, and numerous lighters and small craft.

The two graving docks are in the south-western corner of the Bassin du Vieux Port: immediately to the north are three slipways. The Darse de l'Amirauté has a slipway at its eastern end.

There are large warehouses and ample stacking space on all the moles and throughout the port area generally.

There is a common supply of water for boilers and drinking: it is laid on to the quays and is also available from water-boats. Most of the town's water is drawn from the Oued Harrach, mainly from the Baraki district. Large stocks of coal are normally maintained and can be loaded at the Quai à Charbon at a rate of up to 1,800 tons per day (cf. pp. 116-117). Details of the oil installations, which (including those at Hussein Dey and Maison Carrée and on the Oued Harrach) have a capacity of more than 220,000 cubic yards (170,000 cu. metres), are given on p. 441. There is an electric power station (thermal) on the Quai de Dieppe in the Bassin de Mustapha, in addition to the thermal power stations at Hamma (p. 273, Photo. 59) and Hussein Dey (p. 274). All three stations are interconnected and, in conjunction with the Illiten hydro-electric station, supply an extensive area inland. The gasworks are adjacent to the Hamma power station.

Communications

Rail: Both the town and port of Algiers are served by a normal-gauge railway which divides at Maison Carrée, the western branch

leading to Blida and Oran and the eastern to Constantine and Tunis. The Gare Centrale is in the centre of the town behind the Quai Bab Azoun and a short distance south-west of the Gare Maritime, which is on the Môle Al Djefna. There are several subsidiary stations in the city area and a large marshalling yard at Agha station to the west of the Grand Môle. The tramway along the coast from Algiers to Guyotville and Castiglione with a branch to Koléa is no longer used, and in recent years the track has been partly taken up.

Road: Algiers is the centre of the dense network of roads serving the Mitidja and excellent roads lead west to the department of Oran and east to the Kabylie and the department of Constantine. There are Routes Nationales along the coast westward to Castiglione, Cherchel, and Oran; across the Mitidja plain to Blida, whence branches lead west to Oran and south to Laghouat; inland to l'Arba, Bir Rabalou, and Bou Saada; and eastward through l'Alma to Ménerville, from which Routes Nationales lead to the coast and interior of the Grande Kabylie and to Sétif, Constantine, and the ports of eastern Algeria.

DELLYS (Fig. 36; Vol. I, Fig. 33). Lat. $36^{\circ} 55' N.$, long. $3^{\circ} 55' E.$ Population, urban 4,038 (951 Europeans); commune 18,485 (951 Europeans). Altitude 214 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 110/190). Hospital. Hotels (2). Garages (2).

Dellys is a small port on the rock-bound coast of the Grande Kabylie. The harbour lies south-westward of the Pointe de Dellys, which is about 4 miles eastward of the estuary of the Oued Sebaou and 2 miles to the east of Cap Benngut. The town is on the western side of the harbour and is walled and regularly laid out with several modern buildings, including a school of arts and crafts and large barracks. There is a picturesque native quarter with steep, winding lanes, often shaded by vines. The natives in the surrounding district were originally Berber, but have been much arabized, and are no longer Berber-speaking.

History

Dellys is probably built on the site of the ancient town of Cissi, and Roman remains can be seen in the ramparts and the great cisterns in the west, near the Porte de l'Assouaf. Later the Arabs built a town which formed part of the kingdom of Bougie and was claimed by both the Hafsids of Tunis and the Zianids of Tlemcen. For a few

FIG. 36. *Dellys*

years it belonged to the Spanish before being taken by the Turks in Algiers. It first became French in 1837 and was finally occupied in 1844 at the end of Marshal Bugeaud's campaign against the Flissa.

Industry and Commerce

As elsewhere in the mountains of Kabylie, there has been little European colonization in the district, and the only industry is the making of baskets from the dwarf palm. Tunny are caught, but few other fish. There is one factory in which the barytes mined at Bou Mahni near Dra el Mizane is treated. The trade of the port is small: barytes (over 3,000 tons in 1938), wine, and cork are exported, and building materials, cereals, and fertilizers imported.

Description of Port

The harbour is formed by a breakwater and a jetty. The former is about 1,600 feet long and extends in a south-south-easterly direction from a position nearly half a mile south-westward of the extremity of the Pointe de Dellys. The jetty is due east of the town and extends east towards the breakwater for about 500 feet. The entrance to the harbour faces south, and good shelter is afforded from westerly and north-westerly winds. Vessels up to 2,000 tons can secure alongside the quays in all weathers, in from 13 to 19 feet of water. The port has few facilities and no cranes.

Communications

Rail: The narrow-gauge line from Dellys along the valley of the Oued Sebaou to Mirabeau on the Algiers-Tizi Ouzou normal-gauge line has been closed.

Road: The Sebaou valley is followed by a Route Nationale to Camp du Maréchal with a branch to Haussonviller, both stations on the Algiers-Tizi Ouzou railway. The highland nature of the coastal zone has made the building of a main road near the sea difficult, and the Route Nationale east to Tigzirt and Port Gueydon does not continue to Bougie. A secondary road leads west along the coast to Algiers.

TIGZIRT. Lat. $36^{\circ} 54' N.$, long. $4^{\circ} 07' E.$ Population 275 (143 Europeans). Chief town of a commune mixte. Hotels (3).

Tigzirt is a small village and summer resort about 3 miles west of Cap Tedlès on Cap Tigzirt, near the end of which is a small masonry jetty. Small vessels with local knowledge can obtain anchorage sheltered from easterly winds under the lee of the point. Its trade is purely coastal and only small. The village was founded as an agricultural colony in 1888. It occupies the site of an old Berber

village which later became a port used by the Phoenicians, and then an important Roman settlement, probably Rusuccuru, of which there are some remains on the heathland between the present village and the sea. These include the ruins of a temple built in the third century A.D. and of a large Christian basilica of the fifth or sixth century. There are other Roman remains about 2 miles to the east in the Kabylie village of Taksebt, which was probably the Roman settlement of Iomnium.

Communications

Road: Tigzirt is on the Route Nationale from Dellys to Port Gueydon. A narrow mountain-road runs south to Tizi Ouzou on the main road between Algiers and Bougie and the terminus of the normal-gauge railway from Algiers.

PORT GUEYDON (AZEFFOUN). Lat. $36^{\circ} 54' N.$, long. $4^{\circ} 25' E.$ Population 423 (220 Europeans). Altitude 132 feet. Chief town of a commune mixte. Hospital. Hotel.

Port Gueydon or Azeffoun is a small village in the south-eastern corner of Mers el Fahm (Farm), a large bay on the western side of Cap Corbelin. It has a jetty, which has been lengthened in recent years, with depths of 10 feet and a boat-slip on its northern side. Anchorage, with shelter from easterly winds, can be obtained by vessels with local knowledge to the west of the jetty in depths of from 27 to 33 feet.

The village bears the name of Admiral Gueydon, who was Governor of Algeria in 1871 and crushed the rebellion of the Kabylie (Vol. I, p. 202). Above the French village is a Kabylie settlement with Roman remains, including baths and traces of an old water conduit. Charcoal used to be loaded and sent to Algiers: the name 'Mers el Fahm' means 'the coaling port'. Some outcrops of lignite were discovered on the coast about forty years ago and have received considerable attention from prospectors, especially since the intensive development of the Kenadza deposits (pp. 249-250). At present the port is used only by small coasting vessels in fine weather, and its trade is negligible.

Communications

Road: There is no railway and the main road is the Route Nationale west to Tigzirt and Dellys. About 5 miles west of Port Gueydon a branch leads inland to Fréha on the Algiers-Bougie main road. The

coast road continues to the east for about 8 miles, but through communication with Bougie is impossible.

BOUGIE (Figs. 37, 38; Photo. 28; Vol. I, Photo. 43). Lat. $36^{\circ} 45'$ N., long. $5^{\circ} 05'$ E. Population 31,619 (6,109 Europeans). Chief town of an arrondissement and a commune de plein exercice. Brigade de gendarmerie. Garde républicaine mobile. Court of First Instance. Electricity (3-phase, 110; 3-phase, 220). Drainage. Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (15). Garages (10).

Bougie, the fifth port of Algeria, is on the western side of the Golfe de Bougie, one of the largest indentations of the Algerian coast. It lies to the west of the Baie de Sidi Yahia and about $1\frac{1}{2}$ miles south-west of Cap Carbon (Vol. I, Photo. 10). The roadstead provides shelter from all except north and north-east winds, and can accommodate three capital ships and four cruisers. Extensive reconstruction carried out in recent years, particularly between 1937 and 1939, has made the port one of the best equipped in French North Africa. The town lies to the north of the estuary of the Oued Soummam, which divides the mountains of the Grande Kabylie from those of the Petite Kabylie. It faces south-east, being built in an amphitheatre on the lower eastern slopes of Djebel Gouraya. These slopes are covered with luxuriant vegetation and form a marked contrast to the barren rocky heights which rise to 2,100 feet within $1\frac{1}{4}$ miles of the town on its northern side.

History

Bougie has had a long and varied history since the first Carthaginian settlement. The prosperous Roman colony of Saldae was established by the Emperor Augustus. In 1067 el Nasr, a Hammidite, founded the Moslem city of En Naeria; later its name was changed to Bedjaia, from which the modern name of Bougie is derived. The French word for candle is said to come from the name of the town, as candles were first made from wax imported from Bougie. The town and port were frequented by Crusaders and others, and became a commercial centre for the whole of north-western Africa and the Sahara. It changed hands on several occasions until it finally lost its importance in the sixteenth century. It then became a pirate centre, which attracted the attention of the Spanish, who occupied Bougie from 1509 until its capture by the Turks in 1555. Turkish domination ruined the town, which in 1674 was only a poverty-stricken settlement

of about 500 inhabitants. In 1833 General Trézel occupied Bougie (then a town with a population of about 2,000) after a severe struggle. During the rebellion of 1871 it resisted several attacks by Kabylie tribesmen.

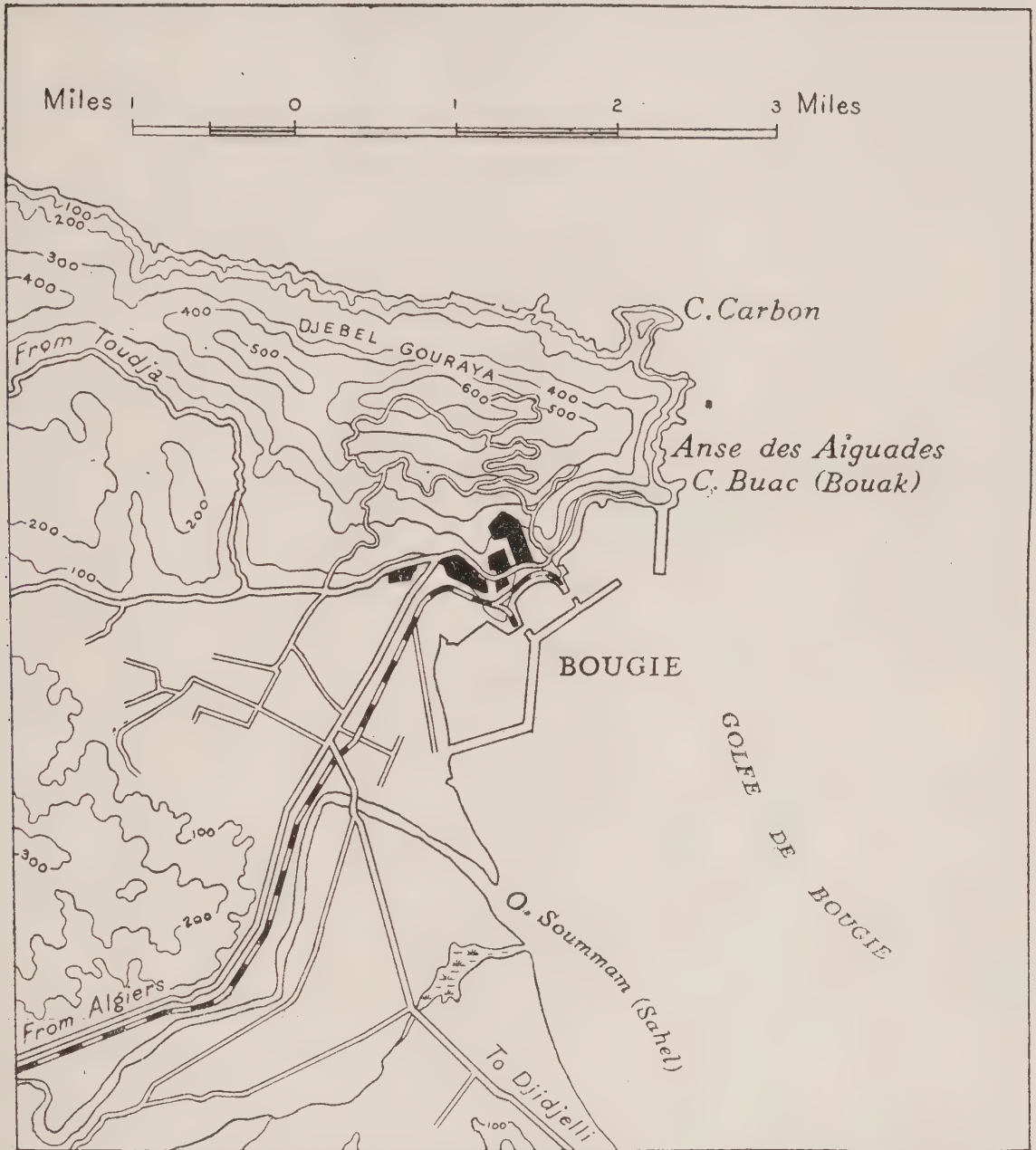


FIG. 37. *The geographical setting of Bougie. Heights are in metres*

The port, which originally consisted of a jetty and a few quays, has been considerably enlarged and improved since 1897. Shortly before the present war it was largely reconstructed, and the Baie de Sidi Yahia now forms the Avant Port and the old Roman harbour the Arrière Port.

Description of Town

Bougie is a walled town built in terraces on two parallel spurs of

Djebel Gouraya, running south-eastward to the shore. The southern tip of the eastern spur, which separates the Port from the Avant Port, is topped by the Fort Abd el Kader, under which the road to Sidi Yahia passes through a tunnel; the Kasba occupies the end of the western spur. The town consists of three parts—the lower town

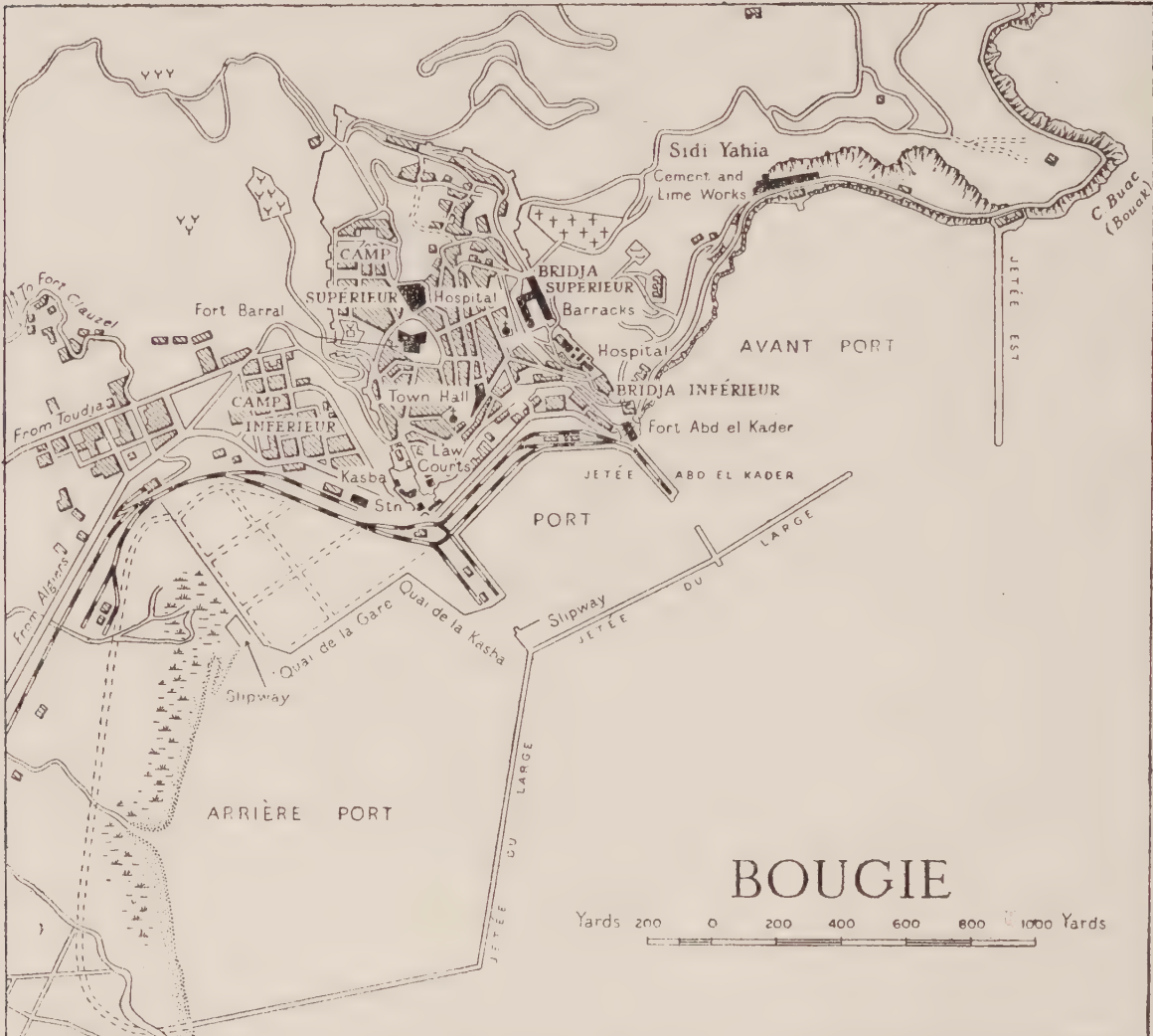


FIG. 38. *Bougie*

near the port, the upper town, and the district known as Camp Inférieur.

The old town is centred on the Place de Gueydon and has most of the European buildings, including the Town Hall. The only old buildings are the Fort Abd el Kader and the Kasba, which is now a barracks. The main street, the Rue Trézel, leads past the Place Foch with the Sub-Prefecture, and continues to the north-east as the Boulevard des Cinq Fontaines.

The upper town has steep streets, some of which are stepped, and includes the native quarter of Camp Supérieur, where there are a

native school of arts and crafts, a civil hospital, and a mosque. Fort Barral, built by Pedro Navarro in the sixteenth century, lies between the upper and lower towns. In Roman times water was brought from springs at Toudja ($15\frac{1}{2}$ miles west) by means of aqueducts, remains of which can still be seen: a canal now supplies the town from the same source. The great Roman cisterns have been restored and are in use to-day.

Camp Inférieur is a regularly laid out district, which has grown up on the level area immediately to the west of the walls in the neighbourhood of the station: it is the main industrial and commercial centre. Immediately to the south-east a large area has recently (1937-1939) been reclaimed between the railway and the Arrière Port.

Industry and Commerce

Green and black olives are pickled and olive-oil is refined, the *grignons*, or residue, from the presses being used in the manufacture of soap. There are cork factories near Fort Clauzel (1 mile north-west of the town), lime and cement works at Sidi Yahia ($\frac{3}{4}$ mile north-east), a tobacco factory, two engineering works, and a small boat-building yard. Railway sleepers, canvas, and sailcloth are manufactured at Camp Inférieur. Sardines, allaches, and anchovies are caught, and some are exported (p. 258).

The trade of Bougie is considerable, since the port is the natural outlet of some of the most densely populated districts in Algeria. In recent years its export of minerals, notably iron ore, zinc ore, and phosphates, has much increased. Other exports include olive-oil, figs, carobs, capers, mandarines, wine (from the Oued Amizour and Oued Marsa districts), wax, cork (raw and manufactured), and tanning materials. The import trade, which by comparison with the exports is very small, consists mainly of flour, salt, rice, sugar, coal, chemicals, building materials, and machinery. The trade of the port in 1937 and 1938 was as follows:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	729	689,389	52,232	365,510
1938	851	799,642	65,693	295,039

Description of Port

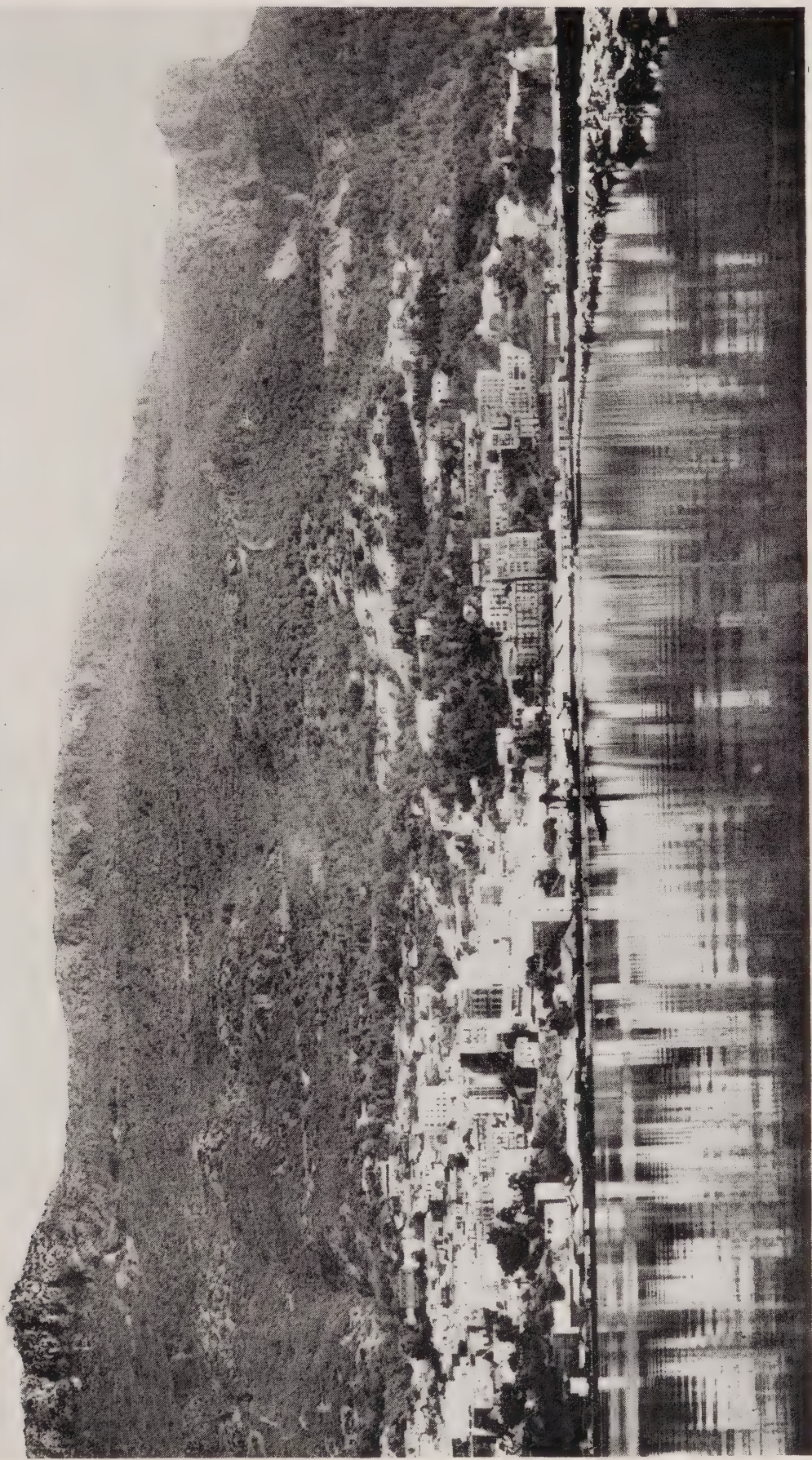
The port is formed by two large breakwaters, the Jetée Est and the Jetée du Large. The Jetée Est extends southward for 2,100 feet from a point about 400 yards to the south-west of Cap Buac (Bouak).

The Jetée du Large is a long rough-sided breakwater zigzagging north-eastward for nearly $1\frac{1}{2}$ miles from a position on the coast 2 miles south-west of Cap Buac. The entrance to the harbour is between the heads of the two breakwaters and faces south: it is 1,476 feet wide with depths of from 36 to 46 feet. There are three basins, which are connected by means of a channel dredged to a depth of 32 feet. They are the Avant Port (or Port Militaire) in the Baie de Sidi Yahia immediately west of the Jetée Est, the Port (or Middle Basin) to the south-west of the Avant Port and on the south-eastern side of the town, and the Arrière Port to the south-west of the Port and to the south of Camp Inférieur.

Avant Port. The Avant Port extends from the Jetée Est to the Jetée Abd el Kader, which projects south-eastward for 675 feet from the Fort Abd el Kader. It is also divided from the Port by a short spur built north-westward from the Jetée du Large. There are no quays, but on the northern side there is a small stone pier, to the south-west of which is a landing-place, although the depth alongside is only about 6 feet. Elsewhere in the basin depths range from 20 to 42 feet. A mooring buoy is anchored in front of the Jetée Est for the use of vessels of more than 30-feet draught.

Port. The Port lies between the Jetée Abd el Kader on the north-east and the Quai de la Kasba on the south-west. It is entered from the Avant Port by a passage which is 260 feet wide and 33 feet deep, and a channel, of the same width as the entrance, has been dredged to a depth of 32 feet through the Port to the Arrière Port. The Jetée Abd el Kader and the Quai de la Kasba, with the shore between them, are quayed, the quays being served by rail and road.

Arrière Port. The Arrière Port is bounded on the south and east by the Jetée du Large, on the north by the Quai de la Kasba and the Quai de la Gare, and on the west by a low marshy shore. It is entered from the Port by a passage, 250 feet wide, which has been dredged to a depth of 32 feet. A square facing the Quai de la Kasba and the Quai de la Gare has also been dredged to the same depth, but the rest of the basin is shallow and undredged with depths of from 6 to 20 feet. Three mooring buoys are anchored off the Quai de la Gare, and twelve small buoys for the use of seaplanes in the undredged area. Between the Quai de la Gare and the railway station is a large reclaimed area, which has not yet been built up. In the south-western corner of the Quai de la Gare there is a tanker berth connected to a bitumen installation, and also the terminal and dump of an iron-ore installation, which is supplied by an aerial cableway.



28. Bougie from the Port, looking northward



29. *Philippeville: Stora in background*



30. *Stora*

The main quays are as follows:

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
PORT (MIDDLE BASIN)	Northern Quay	c. 610	23
	North-western Quay	1,170	23-26
	Quai de la Kasba (north-east side)	710	26
ARRIÈRE PORT	Quai de la Kasba (south-west side)	650	32
	Quai de la Gare	1,350	32

Facilities. There are two large cranes and facilities for discharging all types of merchandise, though equipment is limited.

The harbour craft normally include ten or more lighters, two or three motor-boats used as tugs, and a small number of fishing-vessels.

There are two slipways (used by seaplanes), one in the Port on the north-eastern side of the spur projecting from the Jetée du Large, and the other (with accommodation for small vessels) in the Arrière Port at the south-western end of the Quai de la Gare. Behind the latter slipway there is a boat-building and repair shop.

There are two warehouses, a large open-sided shed, and various smaller buildings on the quays of the Port, and ample stacking space around the Port and in the reclaimed areas adjacent to the Arrière Port.

The water supply is pure and plentiful: there are hydrants on the quays, but no water-boats. A stock of about 8,000 tons of coal is normally maintained, but no supplies of fuel oil, apart from the two tanks of the Shell bitumen installations in the Arrière Port (p. 441). Electricity is usually supplied from the hydro-electric station at Illiten (p. 275), but a small thermal station in the town with a capacity of 1,500 kW. is used in the summer months. There are no gasworks.

Communications

Rail: Bougie is the terminus of the normal-gauge branch of the Algiers-Constantine line from Beni Mansour. The station is to the south of the town in Camp Inférieur. All the quays are served by rail except the Quai de la Gare and the south-western side of the Quai de la Kasba, from which there is easy access to the railway.

Road: There are two Routes Nationales from Bougie to Algiers: the shorter runs west across the Grande Kabylie through el Kseur and Tizi Ouzou, and the longer skirts the southern edge of the massif following the valley of the Oued Soummam through el Kseur, Beni Mansour, and Bouira. Another Route Nationale leads east along the coast to Djidjelli. At Souk et Tnine on this road a branch leads south

along the valley of the Oued Agrioun to Sétif. No road has yet been built westward along the coast to connect with the coastal road leading east from Port Gueydon (cf. p. 309).

LES FALAISES (Photo. 52). Lat. $36^{\circ} 39' N.$, long. $5^{\circ} 23' E.$

Les Falaises is an exposed loading-place on the Anse des Falaises near the head of the Golfe de Bougie, about $2\frac{1}{4}$ miles east of the mouth of the Oued Agrioun. It takes its name from the steep cliffs extending eastward of the place at which an endless belt conveyor for the loading of mineral ores has been built. Iron ore is brought from the mines at Beni Felkai, $7\frac{1}{2}$ miles up the Agrioun valley, by a narrow-gauge (0.70-metre) line. Since 1928 this line has also been linked to the iron-ore and copper mines of Tadergount and Brademah by means of cableways. Production at Beni Felkai ceased in 1930, but operations began again in 1937 at all three mines. Ocean-going vessels moor to buoys and load beneath the conveyor in a depth of 26 feet. Over 100,000 tons of iron ore were shipped in 1938 (p. 240).

Communications

Rail: There is no rail communication except for the mineral line from Beni Felkai.

Road: Les Falaises is on the Route Nationale round the shores of the Golfe de Bougie from Bougie to Djidjelli. A branch at Souk et Tnine (also a Route Nationale) follows the Agrioun valley to Sétif.

DJIDJELLI (IJELLI) (Fig. 39; Photo. 50; Vol. I, Fig. 35). Lat. $36^{\circ} 50' N.$, long. $5^{\circ} 43' E.$ Population 13,472 (2,134 Europeans). Altitude 154 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (3-phase, 125/200). Drainage. Hospital. Hotels (4). Garages (5).

Djidjelli is a small port and roadstead in the shelter of a peninsula $12\frac{1}{2}$ miles east of Cap Cavallo. It is surrounded by one of the most densely forested areas of Algeria: cork oaks are especially common, particularly in the district extending eastward of the port through el Milia to Collo. On the north-eastern side of the town is a rocky peninsula, on which is a citadel. The anchorage provides good shelter in all weathers to the largest vessels.

History

Djidjelli (Igilgili) was a Phoenician trading post, then a Roman colony founded by Augustus, and then an Arab town and port of

some importance. During the sixteenth century it was the chief centre of the pirate Khair ed Din. In 1664 it was taken by a French expedition under the Duc de Beaufort, but within three months the town had to be evacuated with the loss of 2,000 men. It remained a pirate stronghold until its occupation by the French in 1839. Native hostility continued in the district until 1851. In 1856 the old town,

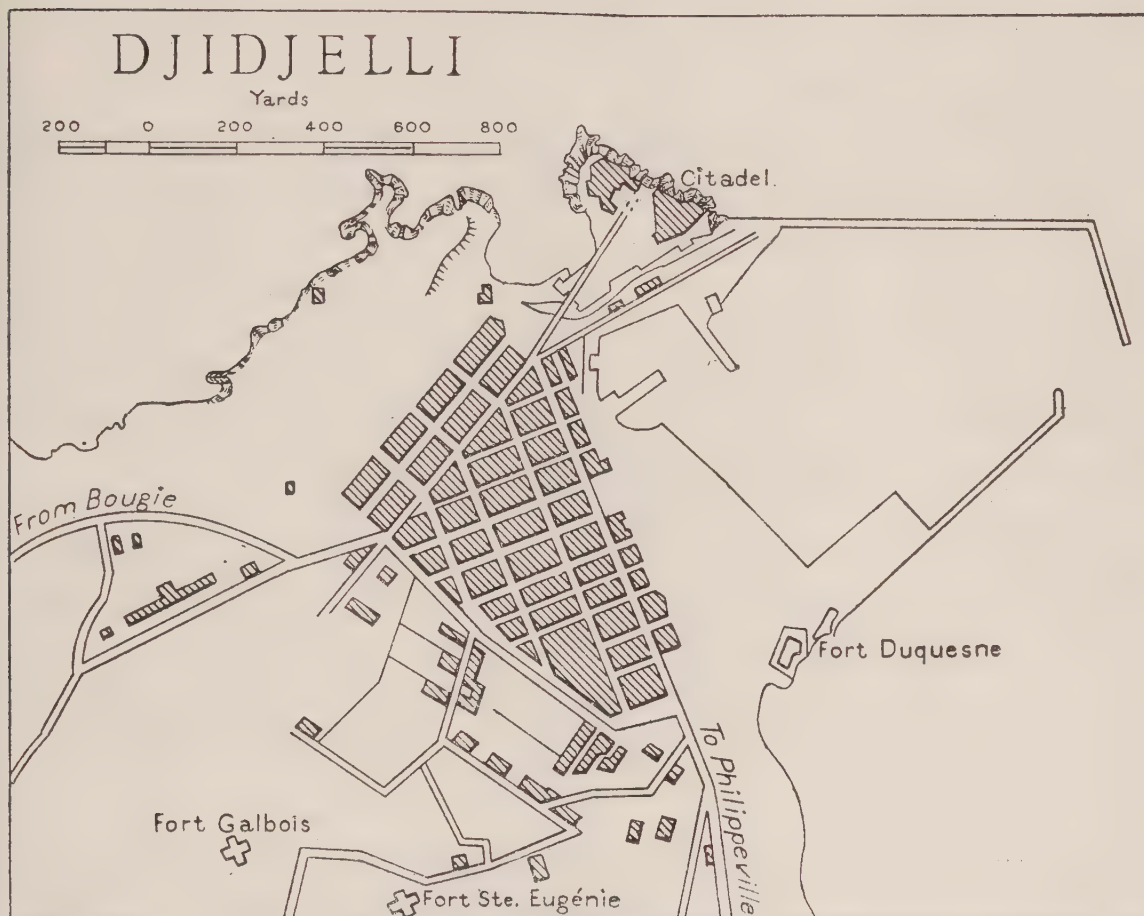


FIG. 39. *Djidjelli (Fijelli)*

which lay some distance to the west of the modern town, was largely destroyed by an earthquake.

Industry and Commerce

Apart from the small colonies of Duquesne, Strasbourg, and Taher, there has been little European settlement in the district owing to the relatively dense native population, the bulk of which is rural and agricultural. An important market is held on Fridays. The main industry is the collection and preparation of cork. Djidjelli handles the bulk of the cork trade in the district west of Philippeville and has several large, electrically-equipped cork factories. Other exports are charcoal, cereals, oil, wine, and timber. Manufactured goods account

for the bulk of the imports. The trade of the port, as shown below, is only small, but could be greatly increased if a railway were built to Constantine to serve the cereal-producing region of Mila and the mining and forest districts of the Kabylie des Babors.

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	414	246,059	6,471	20,856
1938	472	264,248	6,443	71,942

Description of Port

The harbour is formed by two breakwaters, a northern and a south-eastern. The former is 2,470 feet long and extends eastward from the end of a small peninsula on the northern side of the town and then turns in a south-south-easterly direction. The south-eastern breakwater extends north-eastward from Fort Duquesne in the south-eastern part of the town. The entrance between these breakwaters faces south-east and is 720 feet wide. Both the peninsula and the northern breakwater are fringed with rocks and shoals.

Two quays have been built in the western part of the harbour to the north of Fort Duquesne: a western, 656 feet long, with depths alongside of 13 feet, and an eastern, 820 feet long, with depths of between 13 and 23 feet. Vessels discharge by means of lighters.

Facilities. Except for water which is laid on to the quays, Djidjelli offers few facilities. Several lighters and a small tug are available.

Communications

Road: Djidjelli is on the Route Nationale from Bougie along the shore of the Golfe de Bougie to el Milia and Philippeville. At el Milia the road branches north-east to the port of Collo and south to Constantine. From Duquesne (5 miles south-east of Djidjelli) a second-class road leads inland across the Kabylie des Babors to Sétif via St. Arnaud and to Constantine via Mila.

COLLO (Fig. 40; Vol. I, Photo. 41). Lat. 37° 00' N., long. 6° 34' E. Population 5,167 (696 Europeans). Altitude 82 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie départementale. Electricity (continuous, 220). Hospital. Meteorological station. Hotels (3). Garages (5).

Collo (Arabic *el Koll*) is at the foot of the eastern slopes of Djebel el Goufi, which are largely forested and exceed 3,000 feet in places. The town is at the root of the Djerda peninsula (el Jerda), which

divides the small Baie des Jeunes Filles from the larger Baie de Collo. It is surrounded by a fertile and well-cultivated plain, but has remained isolated from the rest of Algeria by the generally mountainous nature of the district. The harbour, however, is well protected, and the open anchorage, one of the best off the Algerian coast, provides excellent shelter from northerly and westerly winds.

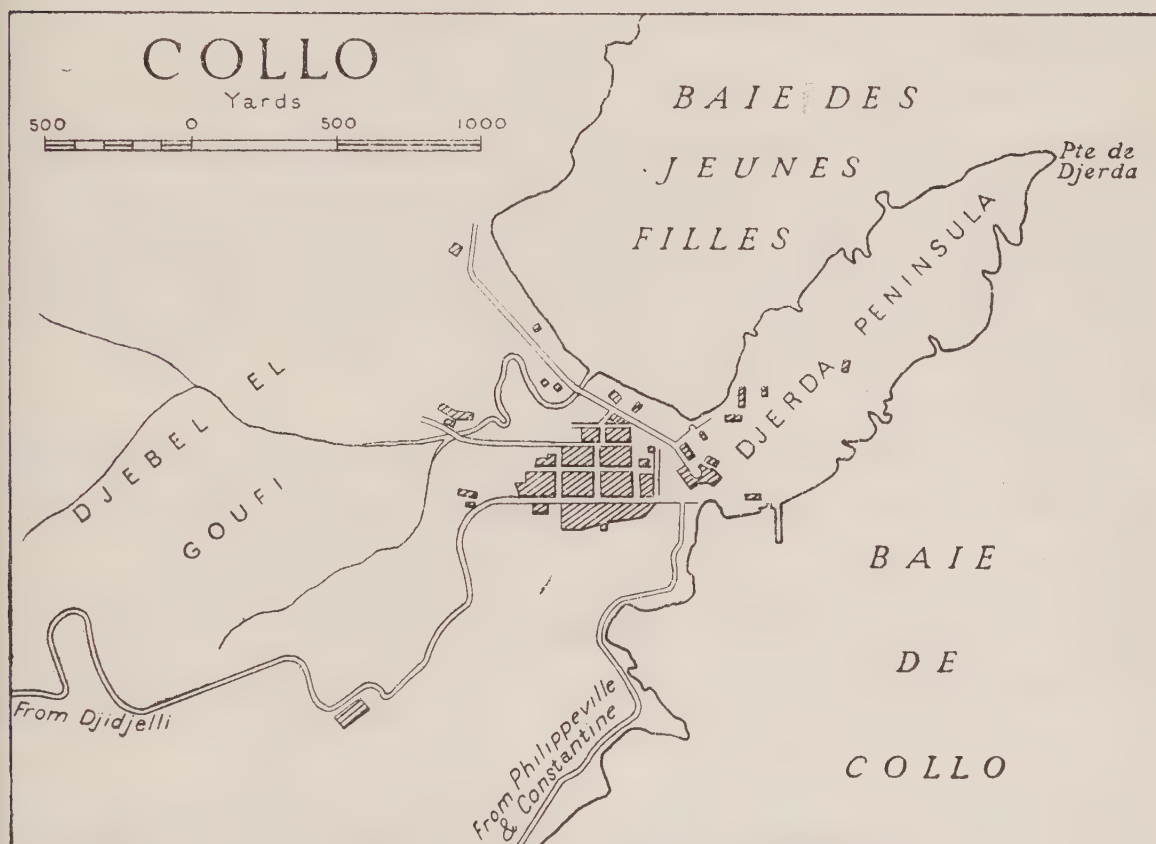


FIG. 40. Collo

History

Collo was first a Phoenician trading station and then the Roman colony of Chullu, which had a population of about 4,000 and was famous for purple dyes. In medieval times it was occupied for short periods by Roger II of Sicily and Peter of Aragon, and from 1519 by the corsair Khair ed Din. For many years it was a centre of the C^{ie} d'Afrique of Marseilles. The French under General Baraguay d'Hilliers occupied the town in 1843.

Industry and Commerce

Collo has a small fish-canning industry and a number of cork factories; embroidered cloths are manufactured. A large market is held on Fridays. The exports consist mainly of cork, with small

quantities of timber and various mineral ores. There is a considerable coastal trade, but the import trade is insignificant. The figures for foreign trade in 1937 and 1938 were as follows:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	518	97,880	0	15,732
1938	471	73,007	2	16,181

Description of Port

The harbour is to the south-east of the town on the south-eastern side of the root of the Djerda peninsula. It is protected by a break-water, 492 feet long, extending southward from a point near the eastern side of the town. There are two quays, one 401 feet long with depths alongside of from 15 to 20 feet, and the other 220 feet long with depths of from 1 to 13 feet. There are few facilities.

Communications

Rail: No railway connexion with the Philippeville–Constantine line has been built on account of the mountainous nature of the district.

Road: Second-class roads lead to Philippeville, Constantine (via Robertville), and Djidjelli (via el Milia), but there is no road suitable for motor traffic to Cap Bougaroun.

STORA (Fig. 41; Photos. 29, 30; Vol. I, Photo. 44). Lat. $36^{\circ} 5' N.$, long. $6^{\circ} 5' E.$ Population, urban 1,430 (1,312 Europeans); commune 6,951 (1,589 Europeans). Altitude 16 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Electricity (3-phase, 115/200). Gas. Drainage. Hotels (2).

Stora is a small village, which gives its name to the Golfe de Stora, about 3 miles north-west of Philippeville, to which it is linked along the coast by two roads. It stands at the foot of steep cliffs, which are thickly covered with cork oaks, and about 500 yards west of the Îlot des Singes: below the village there is a sand and shingle beach. There are numerous Roman remains, notably the reservoirs which have been restored and are in use to-day. Heavy seas roll into the bay in bad weather, but the roadstead generally affords good anchorage and has been used for centuries. Formerly Stora was the 'port' for Philippeville, and some warehouses survive as a relic of those days. A jetty, about 330 feet long, extends southward from a point on the shore about 300 yards west of the Îlot des Singes, but only small

fishing-boats can go alongside it. The present European population consists mainly of naturalized Italians engaged in sardine fishing (p. 258). There is one sardine cannery.

Communications

Rail: The nearest railway is at Philippeville.

Road: Stora is linked to Philippeville and the general road system of the department of Constantine by two roads, one a corniche, along the coast of the Golfe de Stora.

PHILIPPEVILLE (Figs. 41, 42; Photos. 29-31; Vol. I, Photo. 44).

Lat. $36^{\circ} 53' N.$, long. $6^{\circ} 54' E.$ Population 66,112 (33,836 Europeans, including about 3,000 Italians and Maltese). Chief town of an arrondissement and a commune de plein exercice. Section de gendarmerie. Court of First Instance. Electricity (3-phase, 115/200). Gas. Drainage. Hospitals (1 civil, 1 military). Fire brigade. Meteorological station. Hotels (15). Garages (14).

Philippeville, one of the three main ports of the department of Constantine, is on the Golfe de Stora in the centre of the great indentation between the peninsulas which culminate in Cap Bougaroun and Cap Takouch. The port is 3 miles to the south-south-east of Cap Akmès and $1\frac{1}{4}$ miles west of the estuary of the Oued Safsaf. The town stands in the flat bottom and on the sides of a dry valley between two hills, Djebel bou Yala (or Beni Melek) on the west and Djebel Mouader (or Addouna) on the east: the latter reaches the sea in Cap Skikda. Except for the valley of the Safsaf, the surrounding district is hilly, and road construction difficult, especially along the coast. The harbour is entirely artificial, and the town is modern.

History

Philippeville occupies the site of the Roman town of Rusicade, the name of which survives in Cap Skikda. Rusicade prospered until A.D. 435, when it was plundered and destroyed by Genseric. The site remained uninhabited until 1838, when Marshal Valée, after the capture of Constantine, bought some land from the Kabylies for a very small sum. Here he established a small port—known at first as Port de France, though its name was subsequently changed to Philippeville—to serve as an outlet for the newly conquered district. The harbour has been under almost constant extension since 1869. During a great storm in January 1878 the harbour works, with every vessel in port, were destroyed. The present harbour was for the most

part completed in 1892, though there have since been considerable improvements.

On 4 August 1914 Philippeville, like Bône, was bombarded by the German cruisers *Goeben* and *Breslau*.

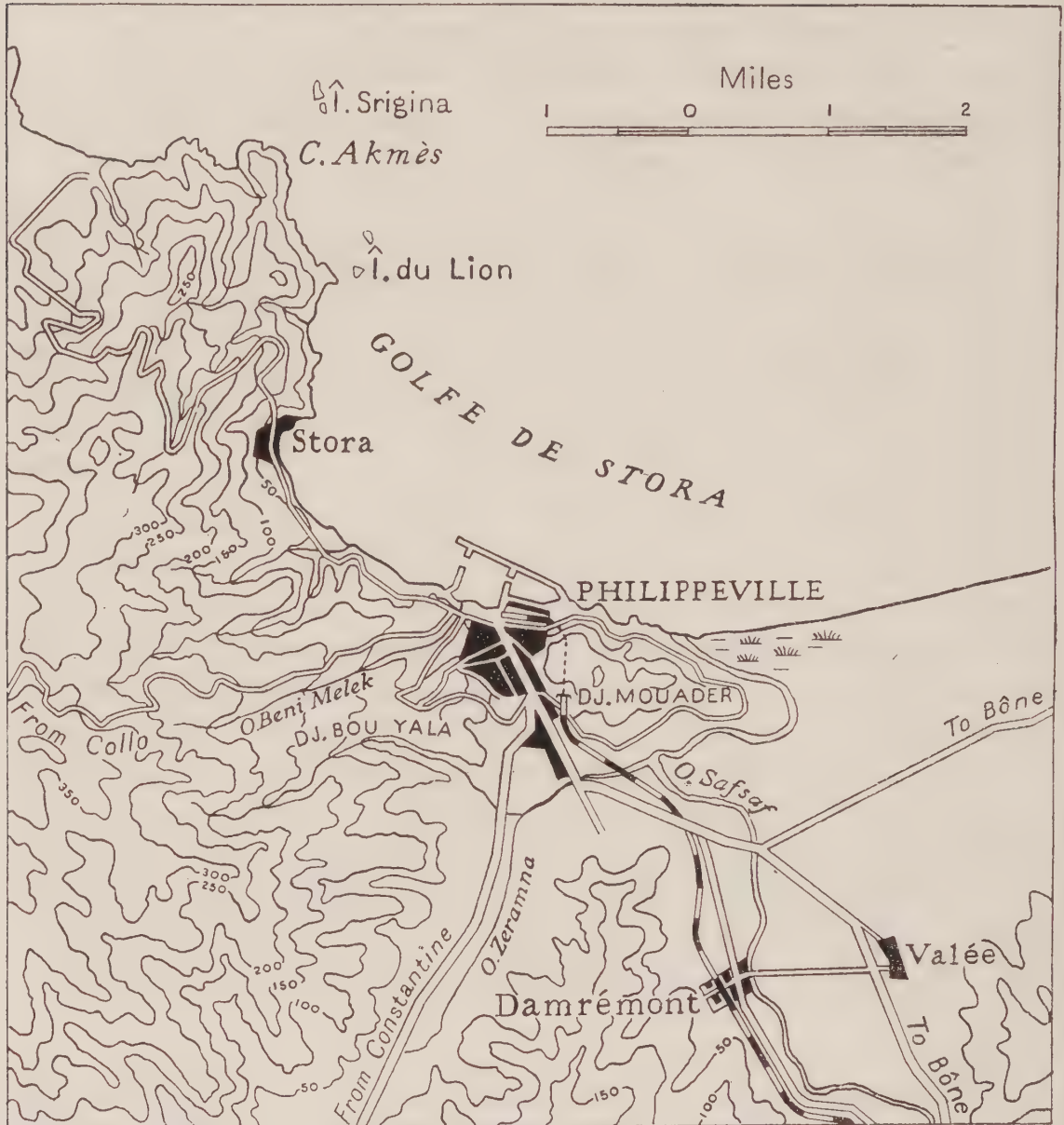


FIG. 41. The geographical setting of Philippeville and Stora. Heights are in metres

Description of Town

Philippeville is a creation of the French and has no old native town, although nearly half of the present urban population is native. It has walls on its western, south-western, and eastern sides. The town lies immediately south of the port, from which it is separated by the Rue de la Plage. This road leads to the Place de Marqué, the commercial centre, from which the main street of the town, the

Rue Georges Clemenceau, runs south-eastward to the Porte de Constantine, along the line of a dry valley. Many of the main buildings lie along this street, including the Sub-Prefecture, the Law Courts, and the theatre. All the streets run either parallel or at right angles to the Rue Georges Clemenceau, except for some on the western side: those at right angles are steep and are sometimes stepped. The military hospital and the barracks are in the east, overlooking the harbour. When the French occupied the town they found the Roman amphitheatre in an almost perfect state of preservation, but its stones were used for building purposes, and the railway was cut through the site. Parts of the Roman theatre, built in the second century A.D., remain, to the west of the Rue Georges Clemenceau, and many of the modern buildings stand on Roman foundations. The Roman reservoirs have been restored and are still used: the largest are those of the Fort d'Orléans, which are fed by a canal from the Oued Beni Melek.

The Faubourg de l'Espérance, a working-class suburb, lies south of the town between the roads to Constantine and Bône: there have been considerable extensions and improvements in this district since 1929.

Industry and Commerce

Philippeville is the nearest of the large ports of eastern Algeria to Constantine (54 miles) and is the outlet of several productive agricultural regions extending southward to Batna and the district served by the railway to Biskra and Touggourt. In the immediate neighbourhood of the port there was considerable European settlement (mainly of vine-growers from southern France) up to the time of the phylloxera epidemic, which affected the Philippeville district first in Algeria (p. 214). Though many of the vineyards have since been re-established with American vines, there has never been much recovery from the check to colonization. The best-known wine is Beni Melek, which takes its name from the ravine on the western side of the town, where there are extensive vineyards.

There are numerous factories in the town, the chief products being corks, bricks and tiles, cigarettes, mineral waters, macaroni, and other cereal products. The fishing industry is mainly centred in Stora (p. 258), but there are sardine canneries in Philippeville.

Unlike most Algerian ports, the weight of the export and import trade of Philippeville is approximately equal. The chief exports are cereals, cork, timber, esparto grass, fruit (especially citrus), flour,

iron ore, iron pyrites and other minerals, and marble: the minerals and marble come mainly from the Massif du Filfila (pp. 240, 243, 254). The import trade consists mainly of manufactured goods, coal, and salt. The trade in 1937 and 1938 was as follows:

<i>Year</i>	<i>No. of ships</i>	<i>Tonnage of ships</i>	<i>Imports (tons)</i>	<i>Exports (tons)</i>
1937	1,328	1,118,090	221,137	219,439
1938	1,174	1,205,542	168,581	168,736

Description of Port

The harbour is protected on the north by a conspicuous breakwater, the Grande Jetée du Nord, which is 30 feet high and extends north-westward from Cap Skikda for about 5,000 feet; and on the south by the Jetée du Château Vert, extending north-north-eastward from near the Pointe du Château Vert for about 1,400 feet. The entrance of the harbour lies between the head of this jetty and a spur jetty, the Traverse Nord, which projects south-westward from the Grande Jetée: it faces west and is 345 feet wide with a minimum depth of 42 feet.

A transverse mole, the Traverse Sud, and a spur jetty projecting southward from the Grande Jetée (Épi) divides the harbour into two basins—the outer or Avant Port and the inner or Grande Darse. The entrance to the latter faces west and is about 295 feet wide. The total area of the port is about 125 acres.

West winds raise the water-level in the harbour by about 1 foot, and east winds lower it 1 foot. In spite of extensive breakwater protection the harbour is very wind-swept, especially by winds from the south, though entrance is easy at all times.

Avant Port. Depths in the Avant Port vary from 6 feet along the southern side to 52 feet near the Grande Jetée. Ships with a draught of 18 feet or less can discharge alongside the Traverse Sud. Larger vessels must lie 15 feet from the quays or secure to the mooring buoys, of which there are three in the basin. Berths in the Avant Port cannot be occupied in bad weather, when swell enters this part of the harbour.

Grande Darse. The Grande Darse has 1,200 yards of quays which are served by railway lines and, though not steep-to, can be used by vessels of up to 18-feet draught. In the eastern part of the basin is the Quai Est, which forms the base of the Grande Jetée and is 520 feet long. Near the southern end is an iron-ore installation connected by an overhead cable transporter with the mines of the Massif du

Filfila, about 11 miles east of the port (p. 240). There is also a large minerals depot extending along the Quai des Minerais towards the Quai Sud.

The spur jetty (Épi) is quayed and has on it various buildings

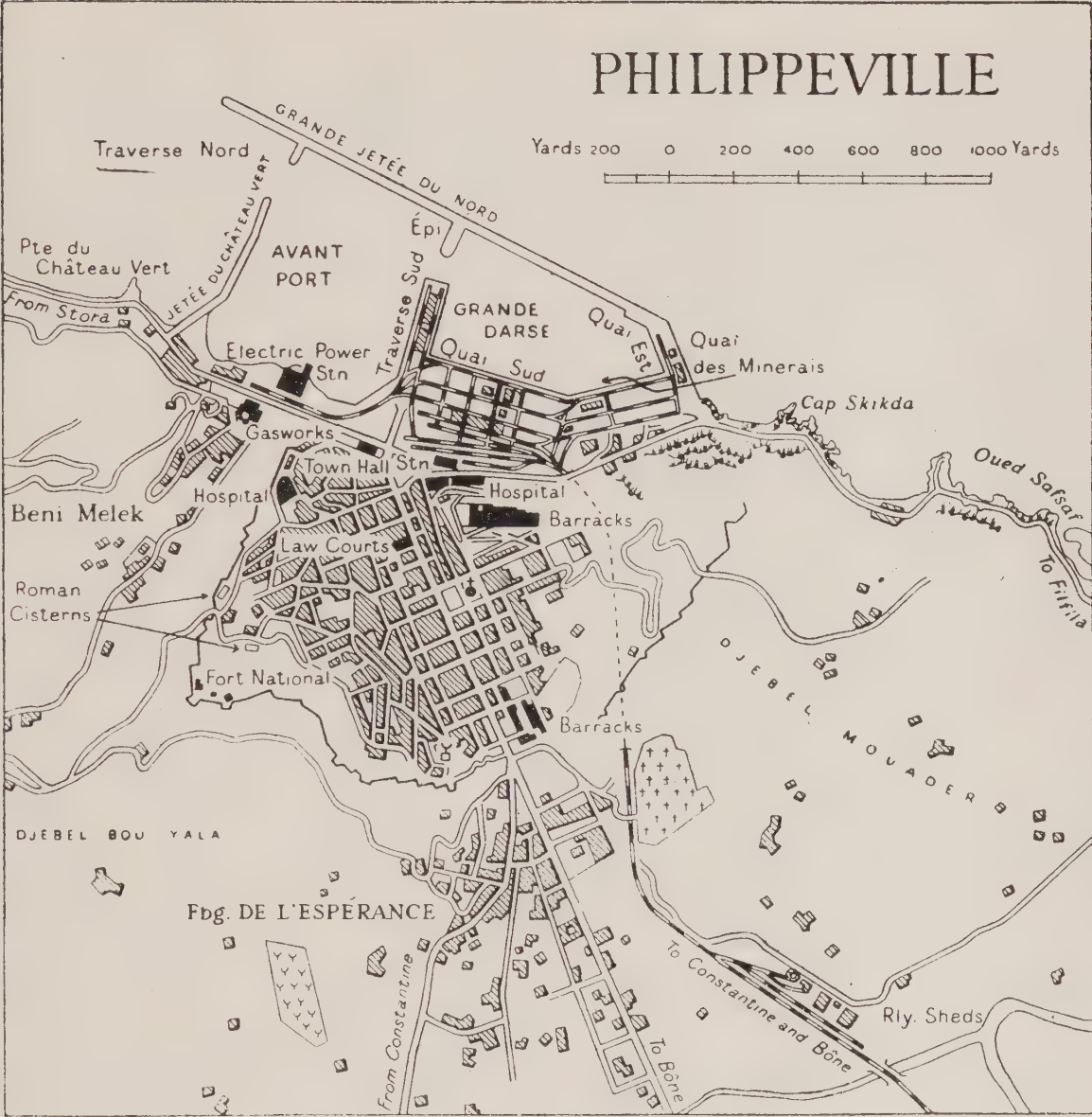


FIG. 42. *Philippeville*

connected with the destroyer or submarine station which formerly occupied this part of the Grande Darse.

Details of the more important quays are as follows:

Basin	Quay	Length (ft.)	Depth (ft.)
AVANT PORT	Jetée du Château Vert	c. 1,550	29
	Traverse Nord (east side)	250	Shoal alongside; 33 at 70 ft. off.
	Grande Jetée du Nord	1,540	Shoal alongside; 33-46 at 70 ft. off.

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
AVANT PORT (<i>cont.</i>)	Épi (west side)	290	(?) alongside; 33 at 50 ft. off.
	Traverse Sud (west side)	950	7-29
GRANDE DARSE	Traverse Sud (east side)	650	23-33
	Épi (east side)	290	(?) alongside; 33 at 50 ft. off.
	Grande Jetée du Nord (unquayed section)	1,670	Shoal alongside; 36 at 70 ft. off.
	Grande Jetée du Nord (quayed section)	165	(?) alongside; 26 at 15 ft. off.
	Quai Est	520	26
	Quai des Minerais	890	22 alongside; 26 at 16 ft. off.
	Quai Sud	1,310	22 alongside; 26 at 16 ft. off.

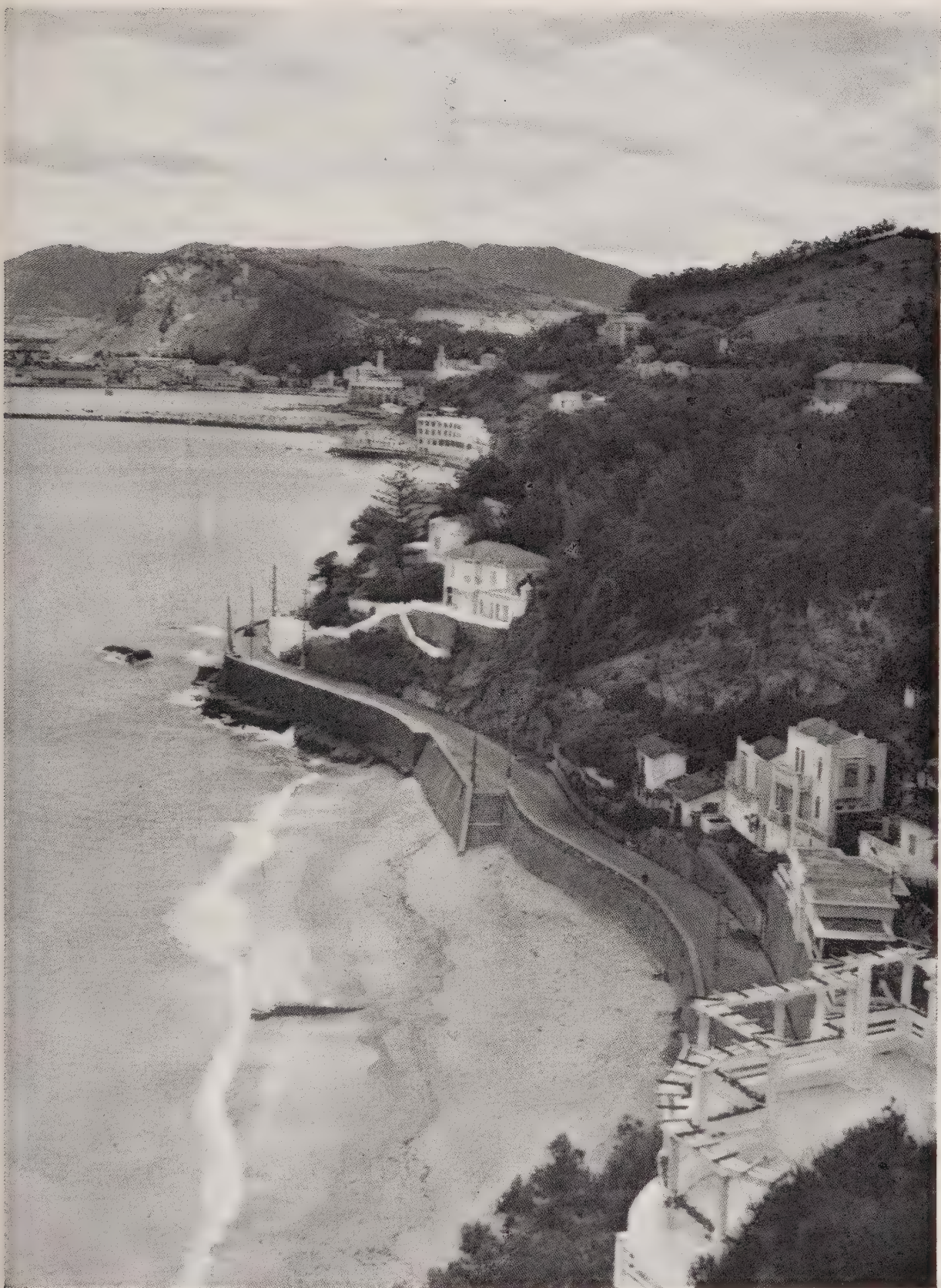
Facilities. The equipment of the port includes several steam travelling cranes of from 2 to 5 tons capacity on the Quai Sud and the Quai des Minerais, a floating crane of 35 tons, and two floating sheerlegs of 13 and 7 tons; various tugs, lighters, and water-boats; and some small hauling-up slipways. Apart from some small foundries and workshops, where minor repairs can be effected, there are no shipbuilding yards or engineering works. There are several warehouses and sheds, the largest being used by the mineral traffic in the south-eastern part of the Grande Darse.

Drinkable water is laid on to all the quays. It comes by pipes from a reservoir in the el Magen district, 25 miles inland on the Constantine road. In normal times a stock of about 6,000 tons of coal and patent fuel is maintained, a large proportion of the coal being reserved for naval use. There are no oil-storage facilities, and the Shell depot (1¼ miles south of the port) is used exclusively for packed oils (p. 442). There is an electric power station (thermal) on the shore of the Avant Port: it is connected to the Constantine hydro-electric station (p. 275). The gasworks are adjacent to the power station.

Communications

Rail: There is a normal-gauge line to Constantine, with a narrow-gauge branch at St. Charles to Jemmapes and Bône.

Road: The Route Nationale leading inland to Constantine has a branch at St. Antoine to Collo and Djidjelli. There is also a Route Nationale to Jemmapes and Bône. The principal local roads lead west to Stora and beyond, by a steep, winding, mountain road to the Oued Akmès and Grande Plage, and east along the shore of the Golfe de Stora to the mines and quarries of the Massif du Filfila.



31. *Philippeville from the west-north-west*



32. *Bône: Grande Darse looking southward to the Jetée Sud*



33. *Bône: Petite Darse, northern end of the Quai Ouest*

HERBILLON (TAKOUCH, MERSA TUKUSH). Lat. $37^{\circ} 03' N.$, long. $7^{\circ} 25' E.$ Population, urban 707 (642 Europeans); commune 3,968 (657 Europeans). Altitude 385 feet. Chief town of a commune de plein exercice. Brigade de gendarmerie départementale. Hospital. Hotels (3). Garages (2).

Herbillon is a village on the shore of a cove at the head of the Baie de Takouch (Tukush bay) which lies on the eastern side of the peninsula ending in Cap (Ras) Takouch and extends from the Île Djezira to la Pointe Percée. The bay affords excellent shelter from westerly winds, though easterly and north-easterly winds send in a heavy sea. The harbour, formed by two jetties projecting southward, is on the northern side of the cove: the eastern or outer jetty is 600 feet long, and the inner, 320 yards to the west, is 300 feet long. Between them is some reclaimed land, at the eastern end of which is a quay, 410 feet long, with a depth of 26 feet alongside. In the harbour are four mooring buoys and two small slipways.

The village is near the site of the old port of Tacatua, and takes its present name from that of the general who subdued a serious revolt at Zaatcha, near Biskra, in 1849. Fishing is the chief local activity: there are also granite and ophite quarries in the district. The trade in cork is only slight, although the Baie de Takouch is surrounded by the steep hills of Djebel Edough, much of which is forested, especially with cork oak. The import and export trade is negligible.

Communications

Road: Communications inland are difficult. The only road branches at Ain Barbar (Ain Zeroula), 5 miles from Herbillon: the eastern and more difficult road goes to Bône via Bugeaud, with a track leading to a village and creek also called Ain Barbar (Vol. I, p. 107); the southern branch leads to Ain Mokra on the Route Nationale from Philippeville to Bône. There is also a local road to the north-western side of Cap Takouch.

BÔNE (BONA) (Figs. 43, 44; Photos. 32, 33, 56; Vol. I, Photo. 45).

Lat. $36^{\circ} 54' N.$, long. $7^{\circ} 46' E.$ Population 86,322 (46,082 Europeans, including about 8,000 Maltese and Italians). Chief town of an arrondissement and a commune de plein exercice. Brigade de gendarmerie. Courts of Assize and First Instance. Electricity (3-phase, 115/200). Gas. Drainage. Hospitals (1 civil, 1 military). Meteorological station. Fire brigade. Hotels (25). Garages (26).

Bône (Arabic *Annaba* or 'jujube trees') is the fourth town in the

country and the largest port of eastern Algeria. It stands on the western side of the Golfe de Bône near the mouth of the Oued Seybouse and about 7 miles south of Cap de Garde. To the west of the town rise the pine-covered slopes of Djebel Edough, from which an

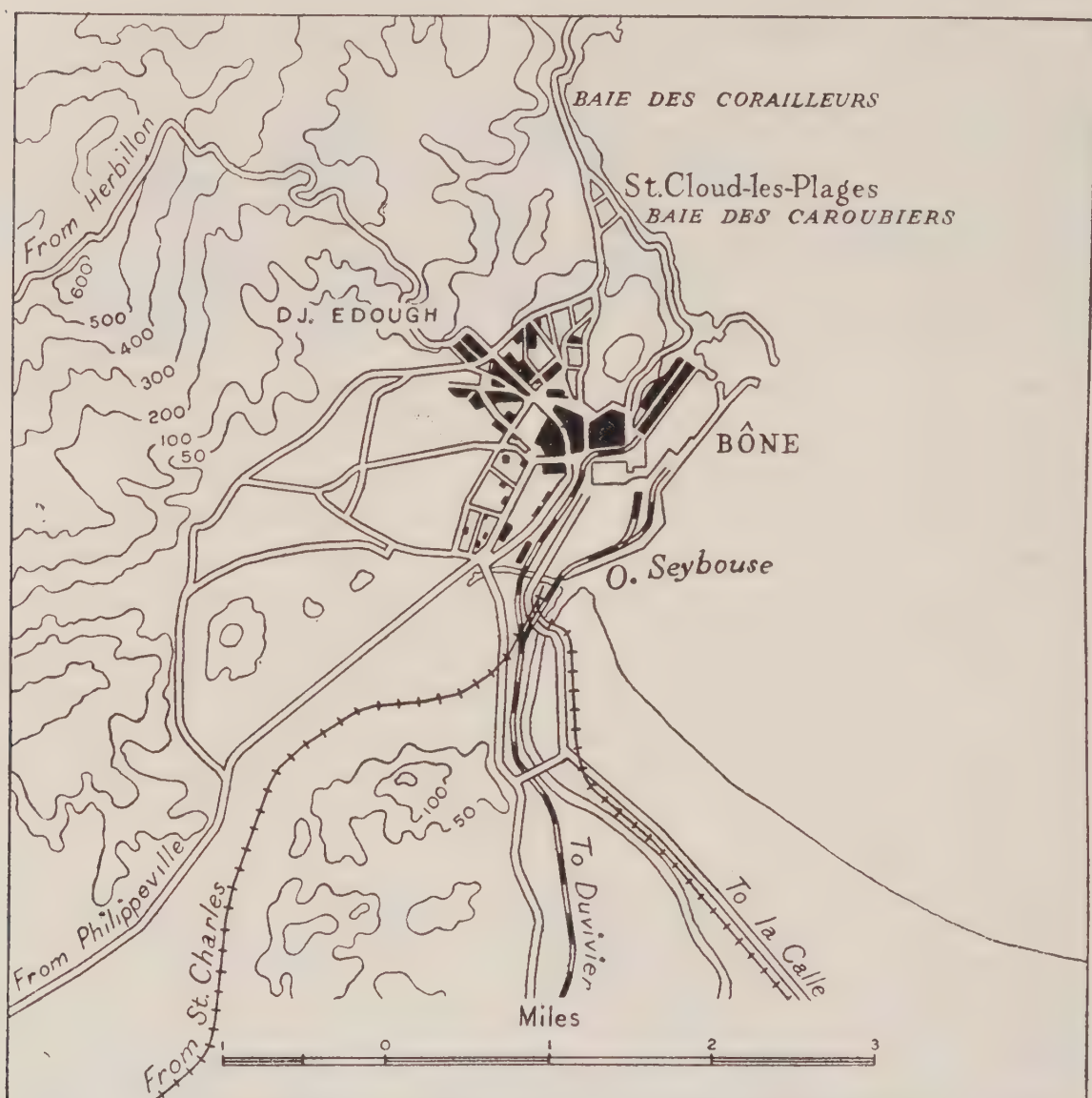


FIG. 43. *The geographical setting of Bône (Bona). Heights are in metres*

excellent and abundant water supply is obtained. The town is mainly modern, though there is still an old native town. The harbour lies to the south and south-east of the city and is one of the safest and best protected in the country.

History

The original settlement of Hippo Regius, or Hippone, about $1\frac{1}{4}$ miles to the south of the present town, was a considerable Roman

town which in the third and fourth centuries A.D. rivalled Carthage as the most prosperous city in Roman Africa. The Christian apologist St. Augustine lived at Hippo, where he was a priest and later the bishop from about A.D. 396 to his death in A.D. 430. A year after his death the Vandals attacked the town and destroyed it completely, apart from the cathedral with his library and manuscripts. In 534 it was occupied and partly destroyed by Belisarius; the Moslems to whom it fell in 697 completed the destruction, leaving only a few ruins—mosaics, columns, statues, and villas—which can still be seen. The reservoirs, which were 53 yards long, 42 yards wide, and had a capacity of nearly 16,000 cubic yards, and the aqueducts have been repaired in recent years to supply the modern town.

Bône itself has been identified with the ancient Aphrodisium, the seaport of Hippo. It has passed through many vicissitudes and changed hands many times since the Arabs built the town. For centuries it belonged to the beys of Tunis, one of whom built the Kasba in 1300. From 1300 to 1550 it was frequented by the Spanish and Italians and during the sixteenth century was held for a time by Charles V. In the eighteenth century it was an important station of the C^{1e} d'Afrique of Marseilles, which maintained an active trade with the port and with eastern Algeria generally up to the time of the French Revolution. It was taken by the French in 1830, but had to be evacuated shortly afterwards: its permanent occupation dates from 1832. The outer harbour was built between 1857 and 1868, but developments were greatly stimulated by the discovery of the Tébessa phosphate beds in 1883, and there have been considerable extensions of the port, notably between 1905 and 1907.

On 4 August 1914 Bône, like Philippeville, was bombarded by the German cruisers *Goeben* and *Breslau*.

Description of Town

The original native town lies to the north of the Petite Darse and is dominated by the Kasba, which is now used as a barracks, on the Colline des Santons. Most of the old town has been modernized and retains little of its original character, apart from some steep narrow streets. It centres on the Place d'Armes, where is the chief mosque, the Mosquée du Bey, and is divided by the Rue St. Augustin. Both the civil and military hospitals are on the east side, adjacent to the port.

The European town lies to the west of the native quarter, beyond the beautiful tree-lined Cours Jérôme Bertagna, and is laid out on a

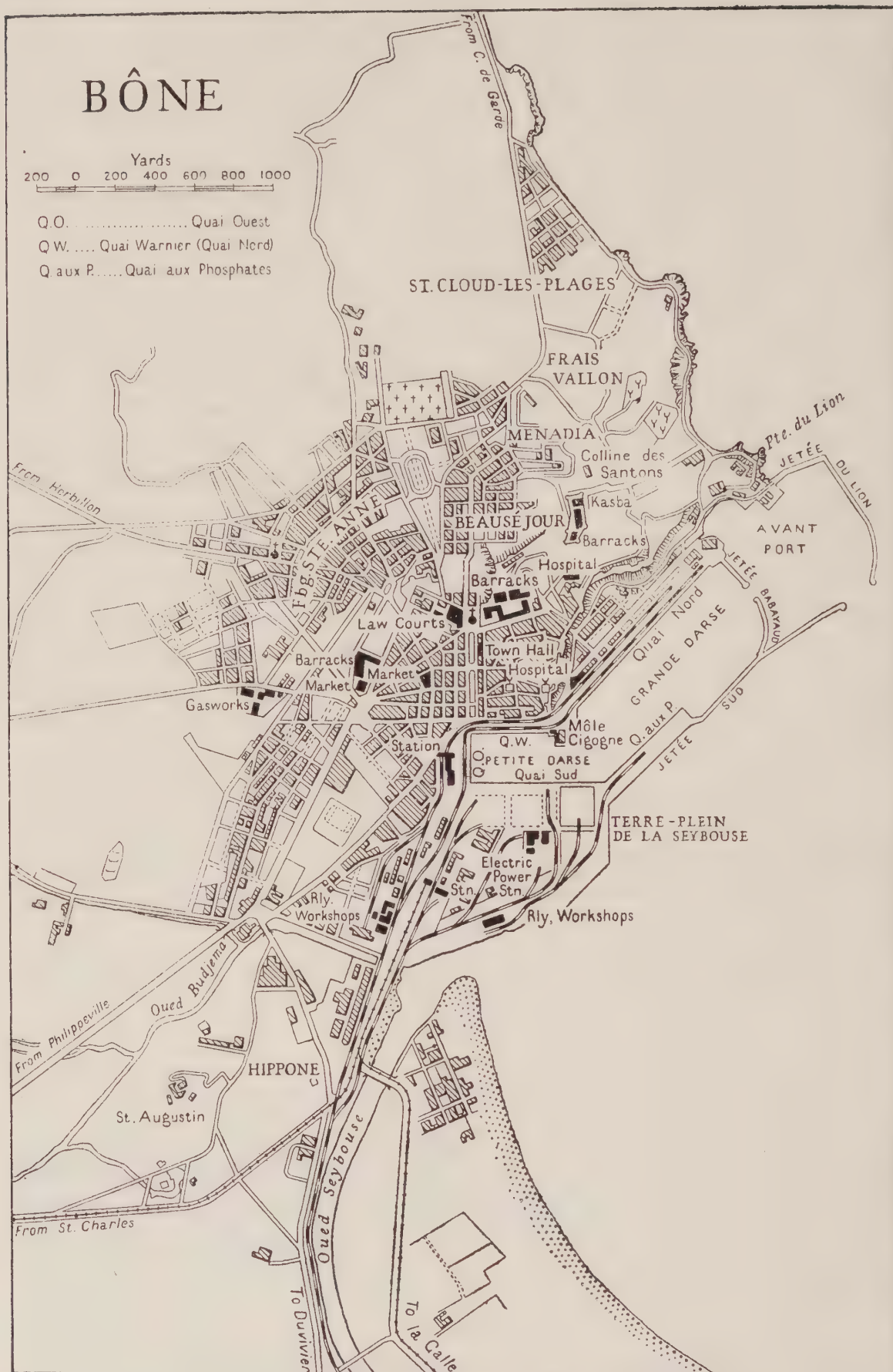


FIG. 44. *Bône (Bona)*

geometrical pattern with straight and wide streets. The principal buildings, including the Town Hall, the Law Courts, the Cathedral, and the theatre, are in or near the Cours Jérôme Bertagna, which is continued northward by the Boulevard Narbonne to the garden suburbs of Beauséjour, Menadia, and Frais Vallon, and the sea-side resort of St. Cloud-les-Plages. In the south several streets radiate from the Sub-Prefecture, including the Rues Thiers, Gambetta, and Bouscarein. The Faubourg Ste. Anne lies to the north-west on the lower slopes of Djebel Edough. The railway station and sidings and most of the industrial buildings are west and south-west of the Petite Darse and on the reclaimed area known as the Terre-Plein de la Seybouse.

The European inhabitants account for nearly 54 per cent. of the total population: there are about 8,000 Maltese and Italians, the latter including the sweepings of the jails of Italy. The growth of the population of Bône since 1856 is illustrated in Fig. 11.

Industry and Commerce

Bône is a large industrial centre with two cork factories, a tobacco factory, a chemical factory with carbon disulphide, nitric acid, and oxygen plants (formerly controlled by the German Kuhlmann combine), a number of flour-mills, large railway workshops, and several engineering firms. There is also a fishing industry (p. 258).

Commercially it serves a very large agricultural area, including the wine and cereal-producing regions of the Seybouse valley, the stock-rearing districts between Guelma and Souk Ahras, and the forests of Djebel Edough and the westernmost parts of the Monts de la Medjerda. But it is predominantly a mineral port for the iron ore of the Djebel Ouenza and Djebel bou Kadra mines (p. 241) and the phosphate deposits of Tébessa. Exports, which greatly exceed imports, consist mainly of iron ore, phosphates, tobacco, barley, hay, esparto grass, wine, wool, and sheep. The chief imports are coal, manufactured goods, and general merchandise.

In contrast to Algiers and Oran, the first and second ports of Algeria, which dominate the trade of their respective departments, Bône shares the commerce of the department of Constantine with Philippeville and Bougie. It is, nevertheless, the third port in the country, with about one-quarter of the total trade, and indeed the volume of its export trade considerably exceeds that of either Algiers or Oran, amounting to almost one-third of the total of Algerian exports. The trade figures for 1937 and 1938 were as follows:

Year	No. of ships	Tonnage of ships	Imports (tons)	Exports (tons)
1937	1,902	2,301,588	310,578	2,122,768
1938	1,791	2,479,392	311,616	2,344,406

Description of Port

The harbour consists of three basins—the Avant Port, the Grande Darse, and the Petite Darse. It lies to the east of the old native quarter and is connected with the northern end of the Cours Jérôme Bertagna by a tunnel.

Avant Port. The outer harbour lies north-east of the town and south-east of the Pointe du Lion, and is about 2,160 feet square. It is enclosed on the north and north-east by the Jetée du Lion, on the south by the north-eastern extension of the Jetée Sud, on the south-west by the Jetée Babayaud, and elsewhere by the shore. The entrance between the ends of the Jetée du Lion and the Jetée Babayaud faces south-eastward and is 780 feet wide and 36 feet deep in mid-channel. Depths in the outer harbour vary from 25 feet in the west to 39 feet in places in the east. On the north-western side of the Avant Port is a small squat jetty with an oil installation on it, and also a seaplane base with a triangular jetty.

Grande Darse (Photo. 32). The Grande Darse is entered through a pass (230 ft. wide and 33 ft. deep) in the middle of the Jetée Babayaud, and is 3,420 feet long (from north-east to south-west) and 1,170 feet wide. It is separated from the Avant Port by the two sections of the Jetée Babayaud, and protected from the sea by the Jetée Sud. It is bounded on the north-west by the Quai Nord and on the south-east by the Quai aux Phosphates, a broad quay (not yet completed) built on the harbour side of the Jetée Sud. Between the Grande Darse and the Petite Darse is the Môle Cigogne, to the south of which is the Passe Cigogne (about 450 ft. wide) leading to the Petite Darse.

Petite Darse (Photo. 33). The innermost part of the harbour is a rectangular basin, 1,050 feet long (from east to west) and 810 feet wide. It is bounded on the north-east by the Môle Cigogne, which has two small built-out landing-jetties, each with a slipway, and by quays on its northern, western, and southern sides. The Quai Warnier or Quai Nord is immediately south of the town; the Quai Ouest is adjacent to the railway station; and the Quai Sud is a continuation of the Quai aux Phosphates. On the southern side of the basin is the large reclaimed area known as the Terre-Plein de la Seybouse, on which are a phosphates warehouse, the electric power

station, and several oil tanks. Most of the harbour administrative offices are near the junction of the Quai Nord and the Môle Cigogne.

Details of the chief quays are given below:

<i>Basin</i>	<i>Quay</i>	<i>Length (ft.)</i>	<i>Depth (ft.)</i>
AVANT PORT	Jetée du Lion	3,270	Shoal alongside; 27-42 at 90 ft. off.
	Dépôt des Combustibles (head)	350	(?) alongside; 26 at 180 ft. off.
	Jetée Babayaud (northern arm: north-east side)	620	Shoal alongside; 6-20 at 100 ft. off.
	Jetée Babayaud (southern arm: east side)	c. 900 (curved)	Shoal alongside; 13-24 at 100 ft. off.
	Jetée Sud (north-eastern exten- sion)	1,340	Shoal alongside; 13-32 at 60 ft. off.
GRANDE DARSE	Jetée Babayaud (northern arm: south-west side)	620	Shoal alongside; (?) 20 at 40 ft. off.
	Jetée Babayaud (southern arm: west side)	c. 900	Shoal alongside.
	Quai Nord	2,900	26
	Môle Cigogne (east side)	600	26
	Jetée Sud (Quai aux Phosphates)	2,360	29
	Jetée Sud (between Quai aux Phosphates and Jetée Baba- yaud)	750	(?) c. 20
PETITE DARSE	Môle Cigogne (head)	330	26
	Môle Cigogne (west side landing- place)	150	23
	Quai Warnier (Quai Nord)	1,200	23-26
	Quai Ouest	800	23-29
	Quai Sud	1,320	29
	Quai aux Phosphates (section in Passe Cigogne)	750	29

Facilities. Bône possesses excellent equipment, particularly for dealing with heavy mineral traffic. There are about a dozen cranes of varying size on the quays, including some for the loading of phosphates with a capacity of 400-500 tons per hour. There are also several floating cranes, two floating sheerlegs (1 large), and a 100-ton transporter crane in the south-eastern corner of the Terre-Plein de la Seybouse.

The harbour craft normally includes two tugs, two water-boats, about ten large and numerous small lighters, and many small fishing-craft.

There are no docks, and only small slipways in the northern corner of the Grande Darse, but many repairs can be undertaken by the railway workshops and by those of the C^{1e} Mokta el Hadid.

The total warehouse accommodation is about 110,000 square feet.

There are warehouses in all parts of the port, the largest being the phosphates warehouse behind the Quai aux Phosphates on the Terre-Plein de la Seybouse. The stacking space is ample, especially in the southern part of the harbour.

Water is laid on to the quays, and two water-boats are available. There are normally large stocks of coal, though Bône is a small coaling port compared with Algiers and Oran (pp. 116–117). The capacity of the oil installations exceeds 39,000 cubic yards (30,000 cu. metres): details are given on p. 441. The electric power station (thermal) is on the Terre-Plein de la Seybouse (p. 274), and the gasworks are on the west side of the town.

Communications

Rail: There is a normal-gauge electrified line leading south from Bône to join the Algiers–Constantine–Tunis line at Duvivier. Narrow-gauge lines run west to St. Charles on the Constantine–Philippeville line and east to la Calle. One station (to the west of the Petite Darse) now serves all three lines, though formerly there were three separate termini.

Road: Routes Nationales lead west to Philippeville, south to Duvivier along the Seybouse valley with a branch south-west to Guelma, and east to la Calle and the Tunisian road system. There are narrow roads north to Cap de Garde and north-west to Herbillon.

LA CALLE (PORT DE LA CALLE) (Fig. 45; Vol. I, Fig. 37). Lat. $36^{\circ} 54' N.$, long. $8^{\circ} 27' E.$ Population 5,593 (2,227 Europeans, mainly Italians). Altitude 82 feet. Chief town of a commune de plein exercice and a commune mixte. Brigade de gendarmerie. Electricity (3-phase, 120/210). Drainage. Hospital. Meteorological station. Hotels (4). Garages (2).

La Calle or Port de la Calle is a small town and port about 11 miles from the Tunisian boundary in a district which is largely under cork-oak and other forests. Within about 5 miles are the three lakes, Melah, Oubeira (fresh-water), and Tonga (Garaet Mta el Hout). It is one of the healthiest places on the Algerian coast; frost never occurs in winter, and the heat of summer is tempered by regular sea breezes. The town lies on the southern side of the harbour, though prior to the French occupation of 1836 most of the European inhabitants lived on the islet known as the Îlot (Île) de France, where there are still numerous buildings.

History

The ancient port of Tuniza was in the neighbourhood of la Calle, but the earliest records of the town itself date from the tenth century A.D., since when it has always been a centre of coral fishers and merchants. It is one of the oldest French trading-posts in Barbary. During the sixteenth century the C^{1e} d'Afrique of Marseilles established a settlement, known as the Bastion de France, on a bay about

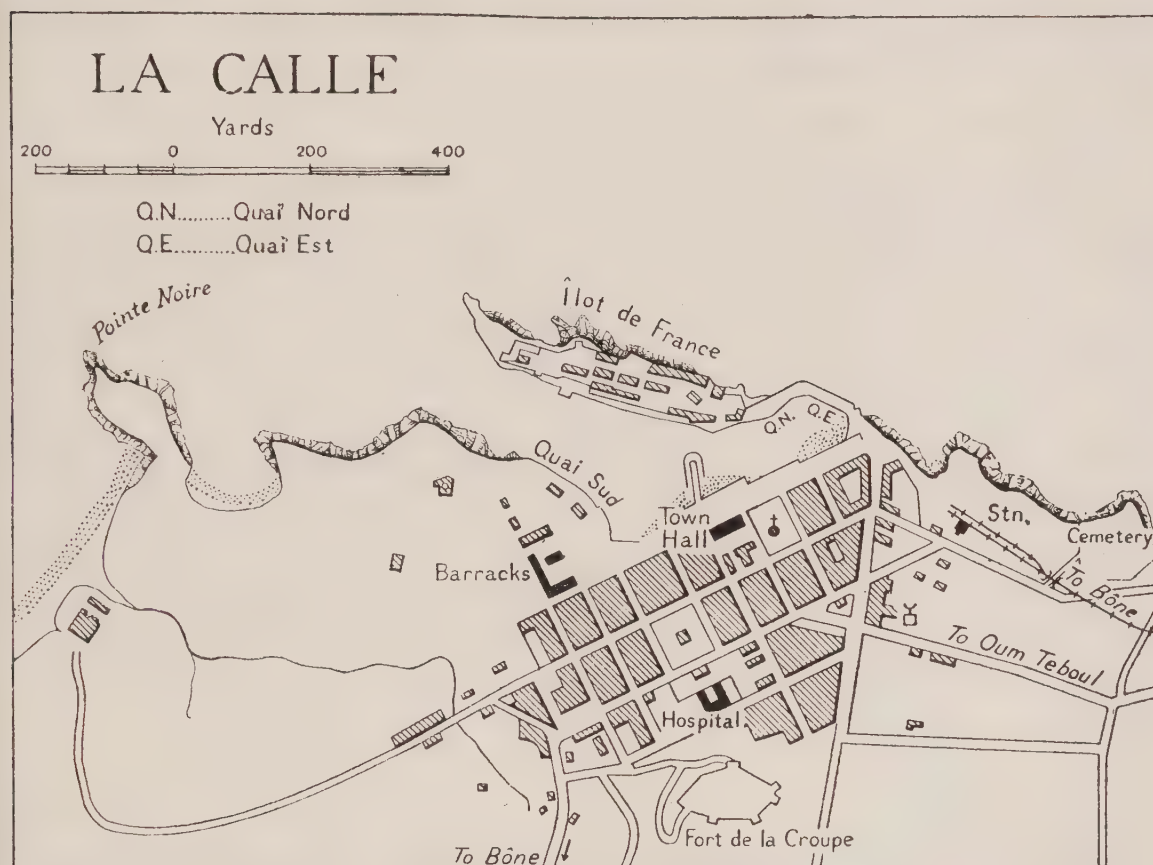


FIG. 45. *La Calle (Port de la Calle)*

6 miles to the west of the present town. After being destroyed and re-established several times the post was removed in 1677 to la Calle, where it was maintained for many years, mainly for the coral fisheries. When war broke out between Algeria and France in 1798 the company was suppressed, and French control was not re-established until 1817. In 1806 the British consul-general at Algiers obtained the right to occupy la Calle and Bône for an annual rent of £11,000, but though the money was paid for several years no practical use was made of the agreement. In 1817 the French resumed possession until expelled during the wars of 1827, when the town was burnt. La Calle was rebuilt in 1836 and the coral-fishing industry survived until 1888, several hundreds of vessels (mainly Italian) using the port

during the season. The imposition of heavy taxes on all save French vessels then drove most of the foreigners away and led to the complete disappearance of the industry. It was restarted on a small scale in 1903 and has increased slightly since the War of 1914-1918.

Industry and Commerce

A market is held daily, and a cattle market each Saturday. There is a small liqueur factory in the town. In addition to the coral fisheries described above, sardines are caught and cured. The trade of the port is only small.

Description of Port

The small harbour lies between Pointe Noire, a rocky point 43 feet high on the mainland, and the Îlot de France, an islet 460 yards long and 100 yards broad, lying over 100 yards off shore. This island is now connected to the mainland by a quayed causeway at the head of the harbour, consisting of the Quai Nord and the Quai Est. There is very little shelter, and the harbour can be entered only by small vessels drawing up to $11\frac{1}{2}$ feet, and then only in fine weather: fresh winds raise a bar which makes entry impossible. The harbour is divided into two basins (an outer and an inner) by a spur on its southern side. In 1932 the channel inside the harbour was dredged to a depth of 15 feet and the northern part of the inner basin to 13 feet.

Facilities. Water is laid on to the quays, but there are few other facilities.

Communications

Rail: There is a narrow-gauge railway, which passes between Lacs Oubeira and Tonga, to Bône.

Road: La Calle is linked to Bône by two roads, one a Route Nationale, following the railway through Blandan and Morris, and the other, a shorter but inferior road, skirting the northern edge of Lac Oubeira and lying nearer the coast throughout. A Route Nationale leading east from la Calle joins the port to the Tunisian road-system through Oum Teboul.

CHAPTER XII

AGRICULTURE AND FORESTRY

NORTHERN ALGERIA is essentially an agricultural country, and its economic prosperity depends largely on the success or failure of its crops. The cultivation of cereals, fruits, and other plants, as well as stock-rearing, has always played a dominant part in the life of the people, and its importance to-day is well illustrated by the fact that in 1938 animal and vegetable products accounted for 5,028 million francs out of the country's total export trade of 5,649 million francs (p. 279). The varieties of soil and climate make possible the cultivation of many kinds of crops, especially cereals, vines, early vegetables, and citrus fruits. Although the land available for cultivation appears to be large, especially in view of the generally low density of population, vast stretches of land are unproductive. The maximum amount suitable for cultivation is about 20 million acres (8 million hectares), which is only 38.6 per cent. of the area of the three northern departments.

The total amount of cultivated land is about 9,500,000 acres (3,800,000 hectares), and is made up as follows:

	<i>Acres</i>
Cereals	7,500,000
Beans, peas, and potatoes	160,000
Meadowland	650,000
Temporary pasture	75,000
Vines	595,000
Olives and figs	500,000
Oranges, lemons, and citrus fruits	25,000
Early vegetables	30,000
Tobacco	75,000
Cotton	15,000
Aromatic plants	10,000

Besides these there are nearly 8 million acres (about 3 million hectares) of forests. All the rest (nearly 35 million acres or 14 million hectares) is either common pasture, fallow land, waste land, or rocky useless country. Fig. 46 indicates the main ways in which the land is used in northern Algeria.

Native methods of agriculture are still rather primitive. Agricultural implements are reduced to necessities such as wooden ploughs made from the branches of trees, with iron ploughshares and wooden earth-boards (Photo. 45), harrows, sickles, and baskets made of alfa, diss, or



FIG. 46. The distribution of crops

similar plants. The improvement of agriculture began with the arrival of the first European cultivators, who brought more and better implements from their own countries. The agricultural implements of the colonists now differ little from those used in France, and some of their tools are better than those used by the more backward peasants in France.

In order that progress may continue agricultural education is being developed in Algeria. Scientific laboratories, special schools, and experimental stations have been set up. Primary teaching includes practical lessons in gardens near the school buildings, and there are also courses for adults so that the farmers may have experienced workers at their disposal. The number of experimental agricultural stations has increased considerably in the last fifteen or twenty years. That near Maison Carrée is particularly concerned with the discovery of the most suitable crops for the Mitidja. Other stations are at Guelma, Sétif, Batna, Orléansville, Tiaret, and Sidi bel Abbès. There are large agricultural schools at Algiers, Philippeville, and Sidi bel Abbès. The Algerian Agricultural Institute is at Maison Carrée (Photo. 34): it was opened in 1905 and is very well equipped. It has subsidiary schools at Rouiba and Berteaux (near Constantine), the latter being particularly concerned with cereal cultivation and stock-rearing. The Jardin d'Essai at Hamma, near Algiers, well known for its luxuriant vegetation and collection of rare plants, is the oldest experimental station in the country: it includes horticultural and agricultural schools.

Although the schools and experimental stations have helped to improve agriculture and agricultural conditions, production remains primarily dependent upon the amount of rainfall. The period from about the end of May to November is usually dry, and sometimes the whole year, or even a series of years, will pass with very little rain. Irrigation, where possible, is invaluable. More than 500,000 acres (200,000 hectares) were artificially watered in 1929; and since then many new irrigation works have been built (pp. 201-204).

The climate is such that Europeans can do all the work required for agricultural cultivation. The natives are lazy, unreliable, and make poor workmen; many will work only enough to provide for their essential needs. Nevertheless there is generally sufficient unskilled labour available. During the grape harvest all labour, especially in the coastal areas, is fully occupied.

Native provident, benefit, and mutual aid societies have been formed not only to provide medical assistance but also for the storage

of cereals for seed, and for food in case of famine. There are about 200 of these societies with 524,000 members and a capital of 78 million francs.

The general position regarding land tenure and land registration, and the conditions under which land has been made available for the agricultural settlement of Europeans, are described on pp. 26-30. Altogether there are 600 European agricultural centres with 230,000 persons, 90,000 of whom are proprietors. Of the 9,266 square miles (2,400,000 hectares) of colonization land, about 2,703 square miles (700,000 hectares) have been purchased by private individuals: the rest is occupied by official colonization schemes. The progress of agricultural colonization is described on pp. 197-201. There is unlikely to be much official colonization in the future: the most that can be done is the development of communications and the establishment of new centres in the areas thus opened up.

Soils

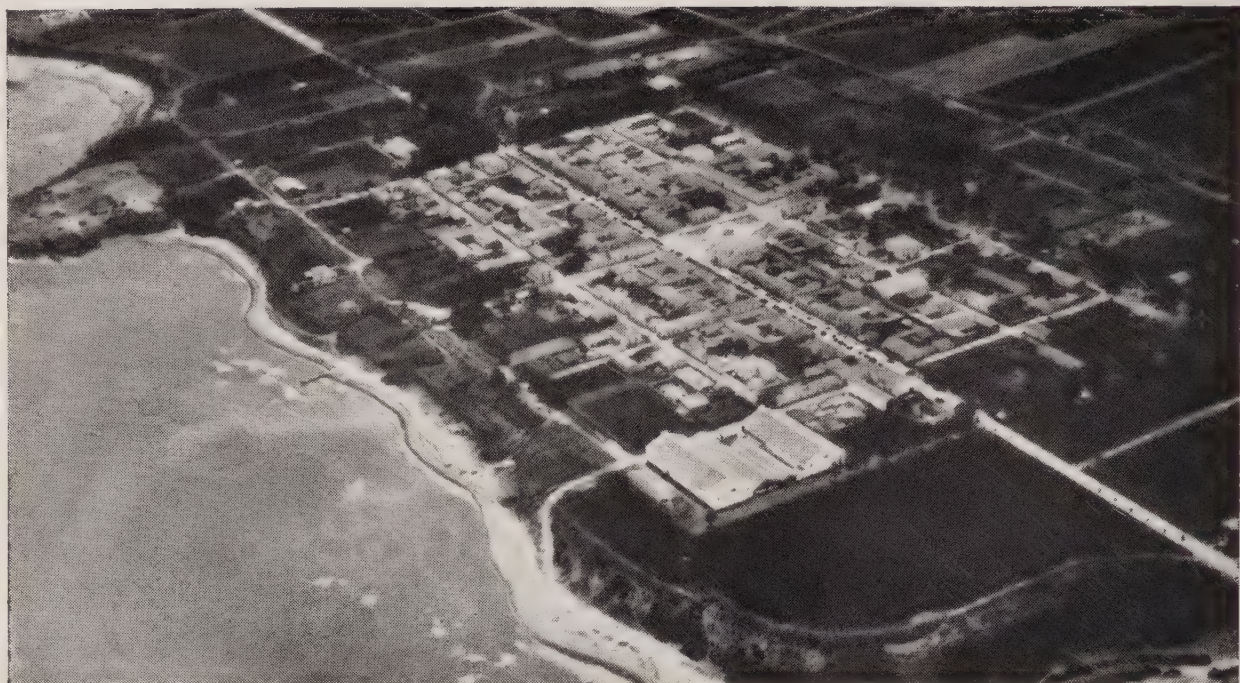
The best soils of Algeria are those of the plains and valleys of the Tell, such as the Mitidja, the Sahel regions, the plains of Bel Abbès and Mascara, and the high plains of Constantine, as well as the coastal plains and the valleys of the larger rivers. The climate has a marked influence on the formation of the various soils of the country. Two main regions can be distinguished, the Tell and the steppes: in addition there are the desert regions, where peculiar conditions make the oases the only possible regions of cultivation.

The soils of the Tell are in general much poorer in humus than comparable soils in northern Europe. One of their characteristics is the contrast between the thin, poor soils of the mountain masses and the loams and deep alluvial soils of the plains. The alluvial soils differ very much from one part of the country to another according to the nature of the rock from which they are derived, and to the texture of the material composing them. The oldest alluvial soils generally consist of pebbles, and are of little use for vegetation and cultivation. The more recent alluvia, old lake-basins or river deposits like those of the plains of the Mékerra, Chélif, Mitidja, and Seybouse, are usually much more fertile. However, they are sometimes saline, as in the plains of the Oran district, or variable and of little depth, as in the plains of Sétif.

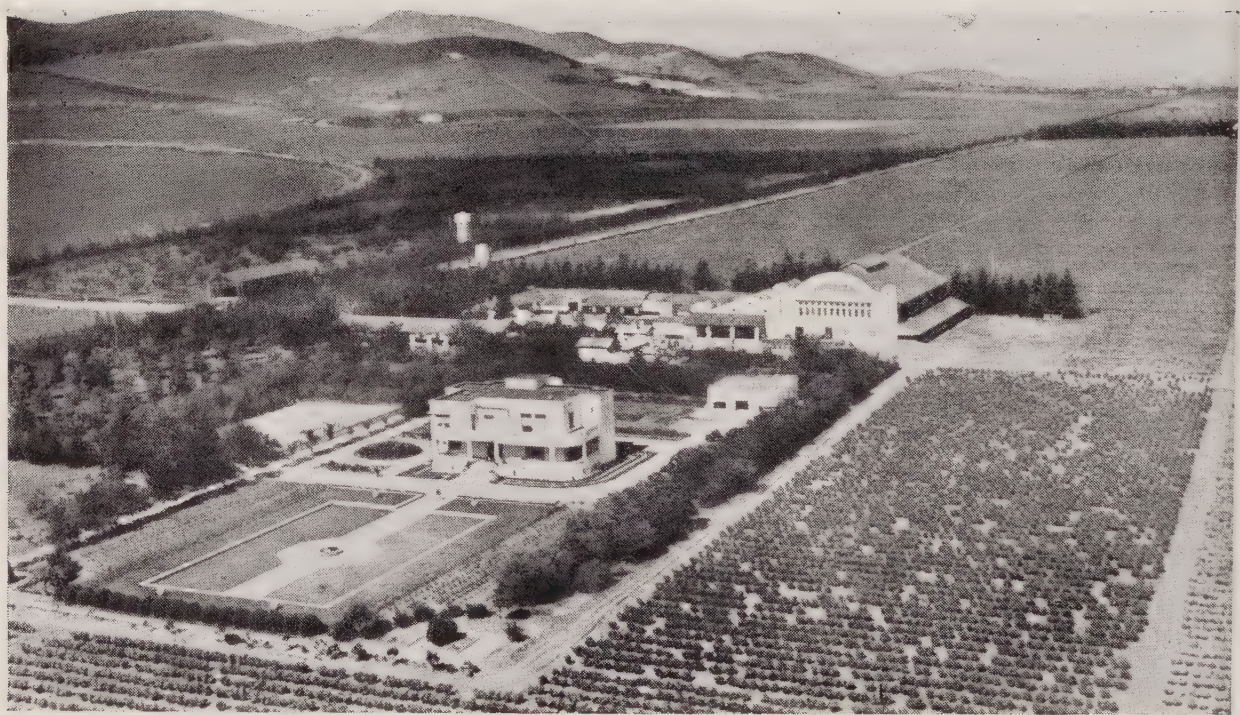
The steppe and semi-steppe soils occur in the regions of low rainfall. In the mountains there is almost no cultivable land, but in the valleys and plains there are light-coloured soils rich in gypsum



34. *The Agricultural Institute, Maison Carrée*



35. *Colonization village, Villebourg near Cherchel*



36. *European farm, the Mitidja*

and carbonate of lime; these soils are generally fertile. The sandy soils of the steppes provide good arable land.

Agricultural Colonization (Fig. 47, Photos. 35, 36)

European colonization began about 1830 immediately after the conquest. Large farms around Algiers were bought by a number of intelligent and energetic men, who gradually extended their purchases into the Mitidja and brought farmers and labourers from France to cultivate the land; they also established small hamlets beside each of these large estates. Clauzel was the only governor between 1830 and 1840 who showed a real interest in colonization. In 1836 he founded Boufarik, which grew rapidly in face of numerous difficulties. In 1838 the Governor-General was ordered to draw up a list of available lands, to find sites for villages, and to study types of buildings for each village, and in this way official colonization began, as described in Vol. I, pp. 198-200.

By 1840 private colonization had succeeded, in spite of many obstacles, in establishing a flourishing agricultural community in the Sahel and Mitidja. The rural population was steadily increasing and the problem of colonization seemed to be solved. All this work was undone by the insurrection of Abd el Kader (Vol. I, p. 195). The official responsibility of colonization was then taken over by the Government, who determined the placing of villages and allotment of land. Marshal Bugeaud, who succeeded Clauzel as Governor-General, took an active part in Algerian colonization and laid the foundations of the system which, with various alterations, has been continued ever since. The agreement of 1841 endorsed the system of grants with the obligation of cultivating the land and living on it. The extent of the grants varied from $7\frac{1}{2}$ to 30 acres (3 to 12 hectares), and the new colonists paid a fee of 1,200 to 1,500 francs, receiving gratuitously a lease of cattle and seeds. In 1846 Algeria had 15,000 rural colonists, of whom 9,000 were French. Among the centres in the department of Oran were Arzeu, Mazagran, Mostaganem, Misserghin, la Sénia, St. Denis du Sig, Mascara, Tlemcen, and Nemours; those in the department of Algiers, besides the Sahel and Mitidja settlements, included Cherchel, Dellys, Ténès, and Orléansville; and among those in the department of Constantine were Philippeville, Damrémont, St. Antoine, Condé Smendou, el Arrouch, Guelma, and Sétif. By 1851 there were 34,000 rural colonists—9,000 in the department of Oran, 17,000 in Algiers, and 8,000 in Constantine.

From 1861 grants were made to companies such as the Société



FIG. 47. Agricultural colonization

Genevoise in the Sétif region and the Société de l'Habra et de la Macta, instead of land being allotted to individual colonists, but this system was not successful and was, therefore, abandoned. The colonists then numbered 100,000, but between 1861 and 1871 numbers decreased: from then until 1895 numbers again increased with a return to Bugeaud's system of creating centres of population and granting land on condition of settlement. Large grants were abandoned in favour of small estates, and between 1871 and 1881 more than 30,000 colonists were settled and more than a million acres (400,000 hectares) occupied. In the department of Oran settlements were established in the plains of Sidi bel Abbès and Mascara, the Sahel, and the Chélif and tributary valleys, with several centres in the Dahra, around Tlemcen, and in the region between the Oueds Chélif and Mina. In the department of Algiers colonization was mainly in the eastern and western Mitidja, the Kabylie valleys, the upper Chélif valley, and the high plains of Médéa and Aumale. In the department of Constantine the main colonization centres were in the plateaux of Sétif and Constantine, the plain of Bône, the hills between Guelma and Souk Ahras, and the coastal hills: two villages were also established near Batna. In all, the rural European population increased from 100,000 in 1872 to 146,000 in 1881.

In the succeeding period there was a falling-off in the numbers of colonists and in the amount of land allotted, though the area of settlement continued to increase in all three departments, and fresh efforts were made in regions beyond the middle chain of the Atlas mountains. From 1900 colonization again increased through the voting of a special budget for Algeria. The regions in which colonization developed were largely determined by the suitability of the land for European settlement according to its fertility, communications, climate, and the rights of the natives to the land. An attempt was made to extend colonization southward into regions on the borders of the Tell and the steppes which were little cultivated by the natives, but could carry good crops when farmed by modern methods. New grants of land were made in the southern part of the Monts de Tlemcen and the Monts de Daia, in the upper Mékerra valley, in the plateau of Sersou, and in the southern part of the Constantine plateaux. By 1905 the rural European population had reached 280,000.

The period from 1906 to 1918 was characterized by a further extension of colonization in the southern zone of the three departments, along the borders of the Aurès and the Bellezma plateau, in

the plateau of Sersou and the Nahr Ouassel, and in the regions of Tiaret and Saida. In 1914 when the war stopped colonization the rural European population numbered 305,000. Between 1919 and 1930 the limit of colonization seemed to be reached in the south, and elsewhere it was increasingly difficult to obtain land. Many villages, planned before 1914 and postponed until after the War of 1914-1918, have had to be abandoned, although a few centres have been established since 1919 in the region of Tiaret and Frenda, the Sersou plateau, the Monts du Titteri, the southern part of the plain of Sétif, and the Batna region. A decree of 9 September 1924, described on p. 29, made European settlement even more difficult than before, and also increased the proportion of colonization land reserved to natives from one-third to one-half.

Since the War of 1914-1918 the rural European population of Algeria has decreased to 230,000 in 1936 (Fig. 6), and much of the colonized land has been sold back to the natives. Thus in 1935 Malakoff, created in 1869, had only 8 colonists remaining out of 36; Fromentin, created in 1900, had only 12 out of 40, and Charon had only 6 colonists and 15 natives living on 68 concessions. This decrease was probably due to climatic conditions, especially lack of rain, poor land, insufficient control by landowners, and the incompetence of colonists. Some effort to remedy the position has been made by giving financial assistance to those colonists who have incurred debts through the failure of their crops, and many have been helped in this way. The establishment in 1928 of a colonization fund enabled the administration to repurchase lands from the larger European owners and divide it up amongst individual colonists.

The following figures show the development of official colonization :

	<i>No. of villages created or enlarged</i>			<i>No. of acres devoted to European cultivation</i>
1830-1850	.	.	126	287,500
1851-1860	.	.	85	625,000
1861-1870	.	.	21	290,000
1871-1880	.	.	264	1,004,247
1881-1890	.	.	107	440,000
1891-1900	.	.	103	300,242
1901-1920	.	.	199	500,000
1921-1934	.	.	67	676,722
TOTAL	.	.	972	4,123,711

The greatest difficulty of agricultural colonization throughout has been the land problem, for Algeria, unlike many countries that

have been colonized, had no large and easily developed open spaces to offer to European immigrants. The land regulations, as described on pp. 26–28, have always been highly complex, representing a combination of Moslem law and native custom, with Turkish influences as well. They were further complicated by the administrative chaos and disorder prevailing after the French invasion in 1830.

Irrigation and Water Storage (Fig. 48)

The rainfall of Algeria is very uncertain in some parts of the country, and consequently water storage is essential, not only to make possible the cultivation of crops such as cotton, maize, and citrus fruits, but also to guard against excessive loss of livestock or crops in dry years. The rainy season in Algeria ends in March, though there are sometimes showers in April and May, but from June to September there is almost complete drought (Vol. I, Chap. IV). In addition, the rains do not begin in some years until November and are then less heavy than the average. Water storage only affects a limited area of Algeria and cannot be a complete solution for the drought problems of the country, but other measures are also possible. Evaporation can be reduced by reafforestation, springs and wells can be protected, and water conserved on the slopes of the hills by means of contour ploughing and the building of horizontal ditches. The natives have long practised irrigation, using springs, streams, and wells to water their flocks and fields, and there are innumerable small schemes scattered over the country, providing water in many cases for only a few acres. European irrigation works are of two types—barrages-déversoirs and barrages-réservoirs. The former are cheaper and easier to construct than the latter, as they consist of channels from the main stream taking the water to the fields from a certain point. Their disadvantage is that the amount of water available is limited by the natural flow of the river, and when the supply is most needed the river is lowest. Such schemes are, however, in use on the Oueds Mouilah (Marnia), Tafna, Mina, Soummam, bou Merzoug, and Seybouse, and on the Oued Chélif at Carnot, Pontéba, Malakoff, Charon, Masséna, Riou, and Relizane.

The barrages-réservoirs are larger and provide water when it is most needed. The water is held in reservoirs by dams and is let out through sluices as required in the dry season. Large areas can be watered in this way, but the dams are expensive, liable to silt up, and subject to flood damage. The dam on the Oued Habra, for

example, was carried away in 1872, 1881, and 1927, and has now been replaced by that at Bou Hanifia (p. 203): the storage capacity of other reservoirs has been much reduced by the mud deposited by streams. In spite of these disadvantages there are ten schemes described below which are either finished or in course of completion. Their approximate location is indicated in Fig. 48.

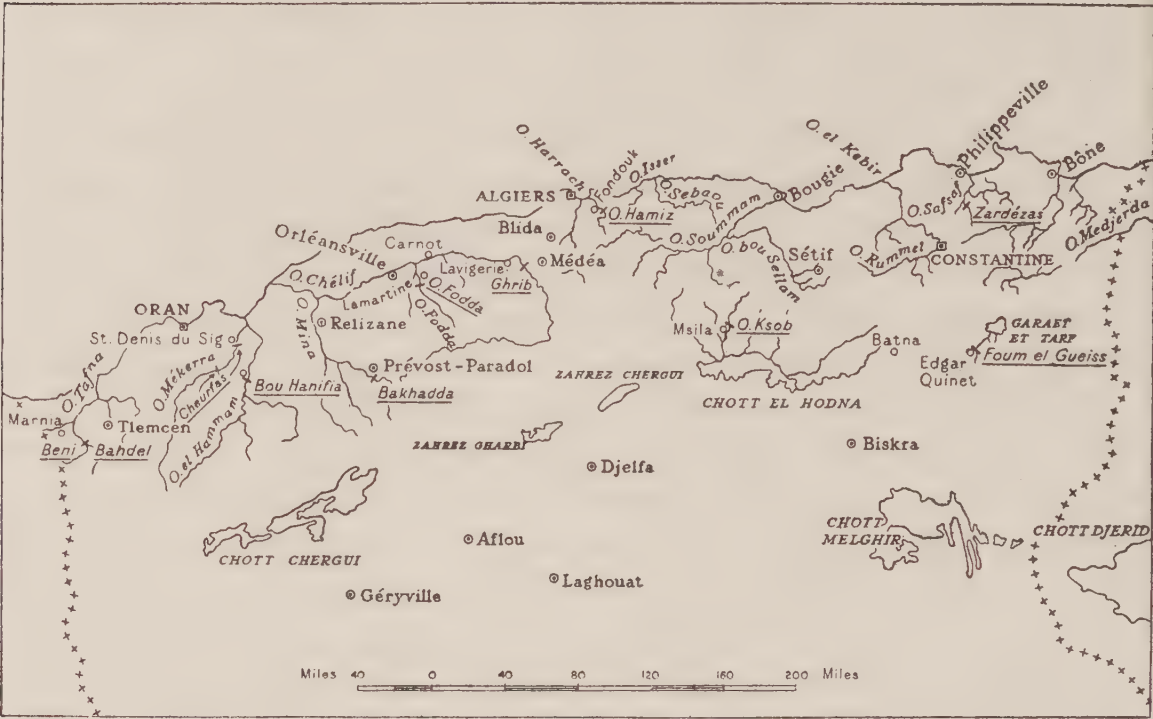
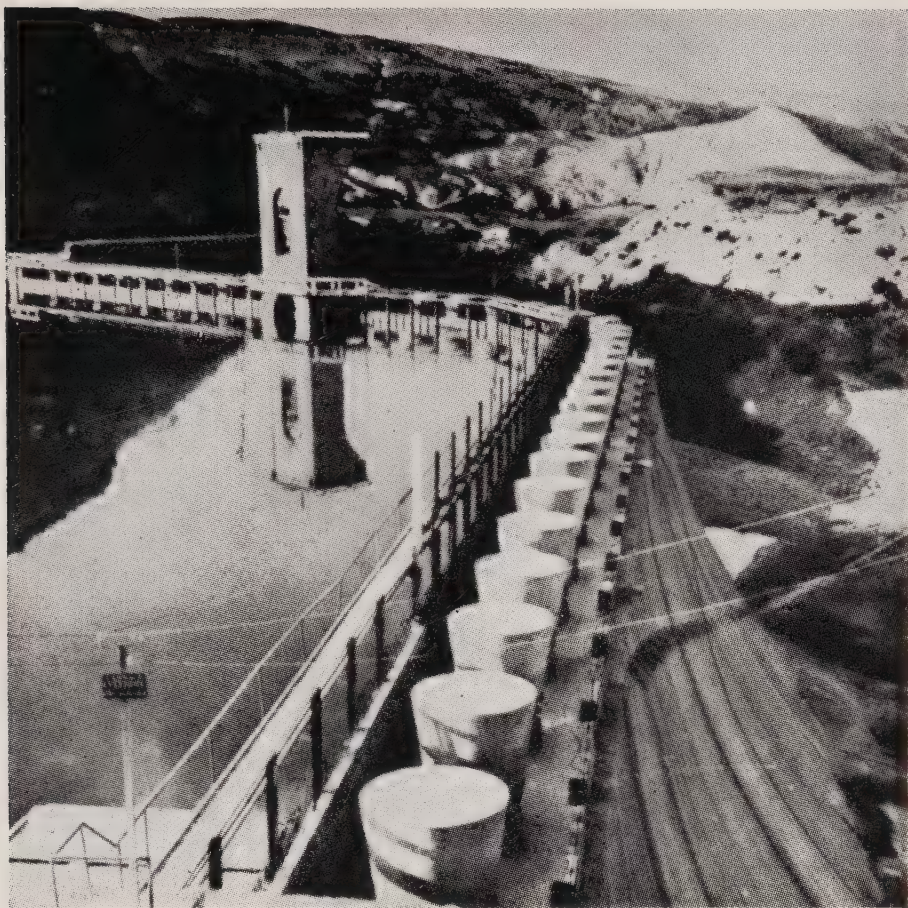


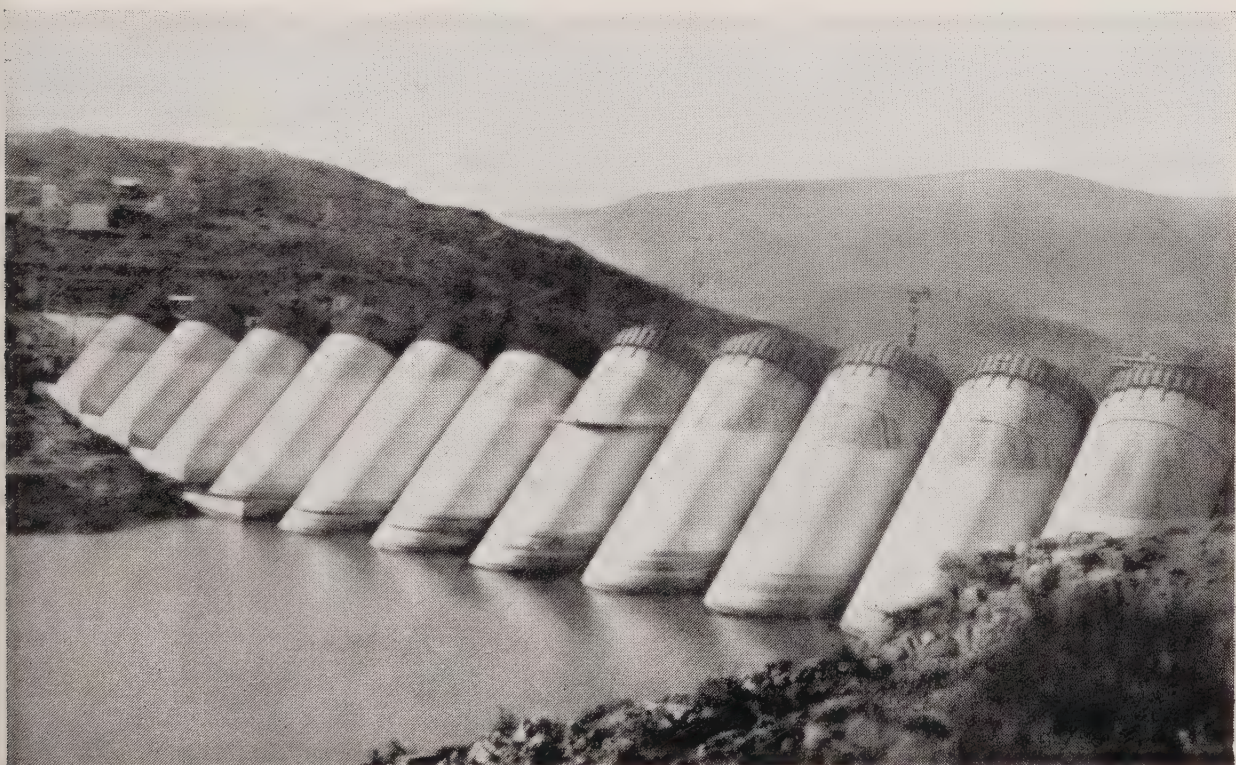
FIG. 48. *The location of principal dams*

		Capacity	
	Height (ft.)	Million gallons	Million cu. metres
Beni Bahdel (Oued Tafna)	154	11,000	50
Cheurfas (Oued Sig)	89	1,320	6
Bou Hanifia (Oued el Hammam)	177	16,060	73
Bakhadda (Oued Mina)	148	8,140	37
Oued Fodda	295	49,500	225
Ghrib (Oued Chélif)	213	61,600	280
Oued Hamiz	148	5,060	23
Zardézas (Oued Safsaf)	115	2,420	11
Oued Ksob (Msila)	105	2,640	12
Foum el Gueiss (Oued Gueiss)	75	550	2

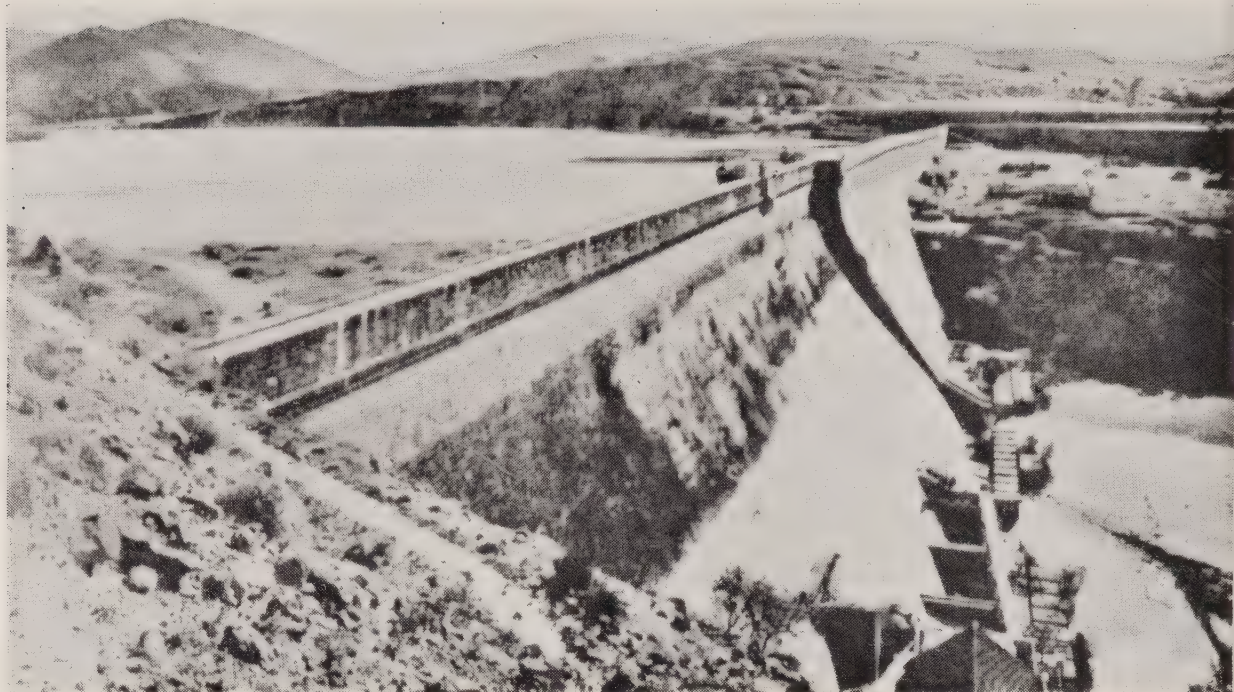
The dam at Beni Bahdel is designed to supply, in addition, two electric power stations producing 15 million units per year, and other dams will probably be used in the same way (cf. pp. 275–276). All these dams are in the Tell except those on the Oued Ksob and at Foum el Gueiss, which are in the High Plateaux. When all the reservoirs are complete between 150,000 and 200,000 million gallons (700 to 900 million cu. metres) of water will be stored, with an annual distribution



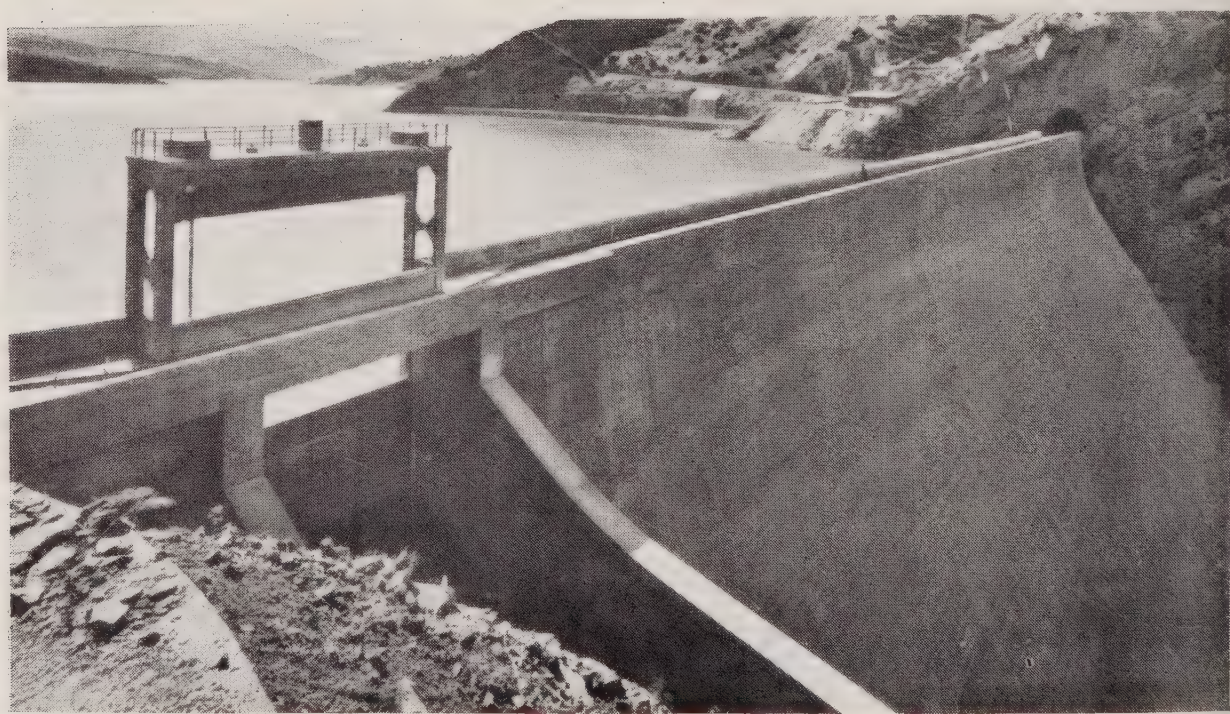
37. *Cheurfas dam*



38. *Beni Bahdel dam*



39. *Bou Hanifia dam*



40. *Oued Fodda dam*

of 110,000 million gallons (500 million cu. metres), and it is hoped that 250,000 acres (100,000 hectares) will be irrigated.

Beni Bahdel (Photo. 38). This is a completed dam on the Oued Tafna, 17½ miles south-west of Tlemcen. It is a concrete structure, 154 feet high, which could be raised to 177 feet. At present it holds 11,000 million gallons (50 million cu. metres), which will water 30,000 acres (12,000 hectares), mainly round Marnia.

Cheurfas (Photo. 37). There are two dams on the Oued Sig, one (the Petit Barrage) 2 miles south of St. Denis du Sig, and the other (the Grand Barrage) about 17½ miles upstream from the town. The latter is just below the junctions of the Oueds Mékerra and Sig and is 89 feet high: the reservoir holds 1,320 million gallons (6 million cu. metres). The two dams together irrigate 20,000 acres (8,000 hectares) of the lower Sig valley.

Bou Hamfia (Photo. 39). This dam on the Oued el Hammam has replaced that destroyed in 1927 at the junction of the Oueds Habra and Fergoug. The storage of 16,060 million gallons (73 million cu. metres) makes possible the cultivation of citrus fruits, cotton, and market-garden produce on 50,000 acres (20,000 hectares) round Perrégaux. The retaining wall of the reservoir is 177 feet high and is built on rocky foundations.

Bakhadda, Oued Fodda, and Ghrib (Photos. 40, 41). These schemes are designed to provide water for cotton and other crops in the Chélif valley. The dams in each case are built where tributary streams or the main stream leave the mountains for the plain. The Bakhadda dam on the Oued Mina is completed, and waters 30,000 acres (12,000 hectares) near Relizane. It is 148 feet high and is made of blocks of rock: the reservoir holds 8,140 million gallons (37 million cu. metres). The Oued Fodda dam is built in the deep gorge above Lamartine. The dam and reservoir are complete, but not the distributing network. The concrete dam, 292 feet high, encloses a triangular lake holding 49,500 million gallons (225 million cu. metres), which water 45,000 acres (18,000 hectares) of the Chélif valley from St. Cyprien in the east through Orléansville and Malakoff to Charon. The scheme near Ghrib on the Oued Chélif, 5 miles north of Dollfusville, is the largest in the country, and waters 75,000 acres (30,000 hectares) above St. Cyprien to Lavigerie. In this reservoir 61,600 million gallons (280 million cu. metres) can be stored, and by further construction the total could be brought up to 74,800 million gallons (340 million cu. metres).

Oued Hamiz (Photos. 43, 44). Between 1934 and 1936 the old dam

on the Oued Hamiz (Arbatache) near Fondouk, 20 miles south-east of Algiers, was strengthened and raised; the reservoir now holds 5,060 million gallons (23 million cu. metres) which water 37,500 acres (15,000 hectares) in the south-eastern part of the Mitidja.

Zardézas. This dam on the Oued Safsaf is comparatively small, with a storage capacity of only 2,420 million gallons (11 million cu. metres). The irrigated area (12,500 acres or 5,000 hectares) is confined to the Safsaf valley between Constantine and Philippeville.

Oued Ksob (Photo. 42). There are numerous dams on the Oued Ksob near Msila, which water 25,000 acres (10,000 hectares) of the Msila plain in the Hodna region. They are all small schemes, with a total capacity of about 2,640 million gallons (12 million cu. metres), and some are not yet complete.

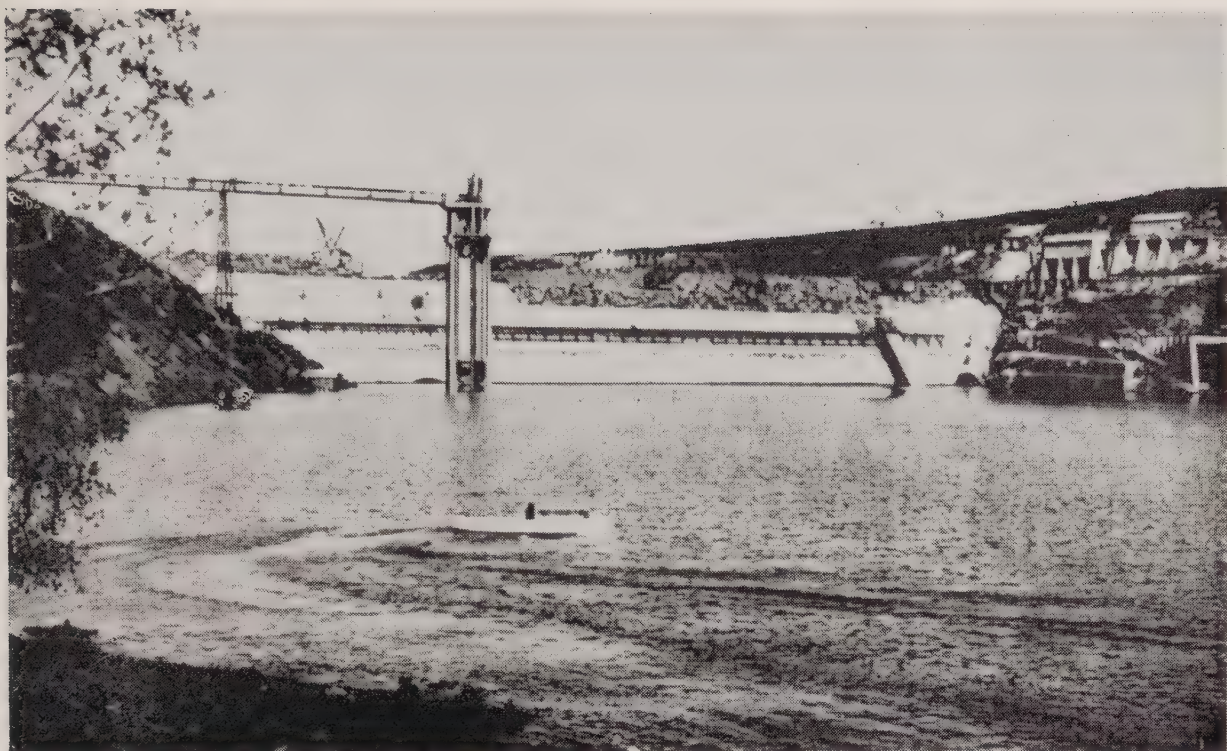
Foum el Gueiss. This is another of the small schemes of the High Plateaux and is on the Oued Gueiss, which flows into the Garaet et Tarf. It is near Edgar Quinet and provides water for 12,500 acres (5,000 hectares). Its capacity is about 550 million gallons ($2\frac{1}{2}$ million cu. metres).

Water storage is advisable in the Tell, but is indispensable for cultivation in southern Algeria. The various methods in use by the natives are described in Vol. I (pp. 72, 73, 80–83, and Fig. 21). The best watered region of the south is between Touggourt and Ourir, where artesian wells can be sunk. Care has to be taken that the sinking of new wells does not reduce the capacity of those already in use; the normal flow from many of them is about 88,000 gallons (400,000 litres) per minute.

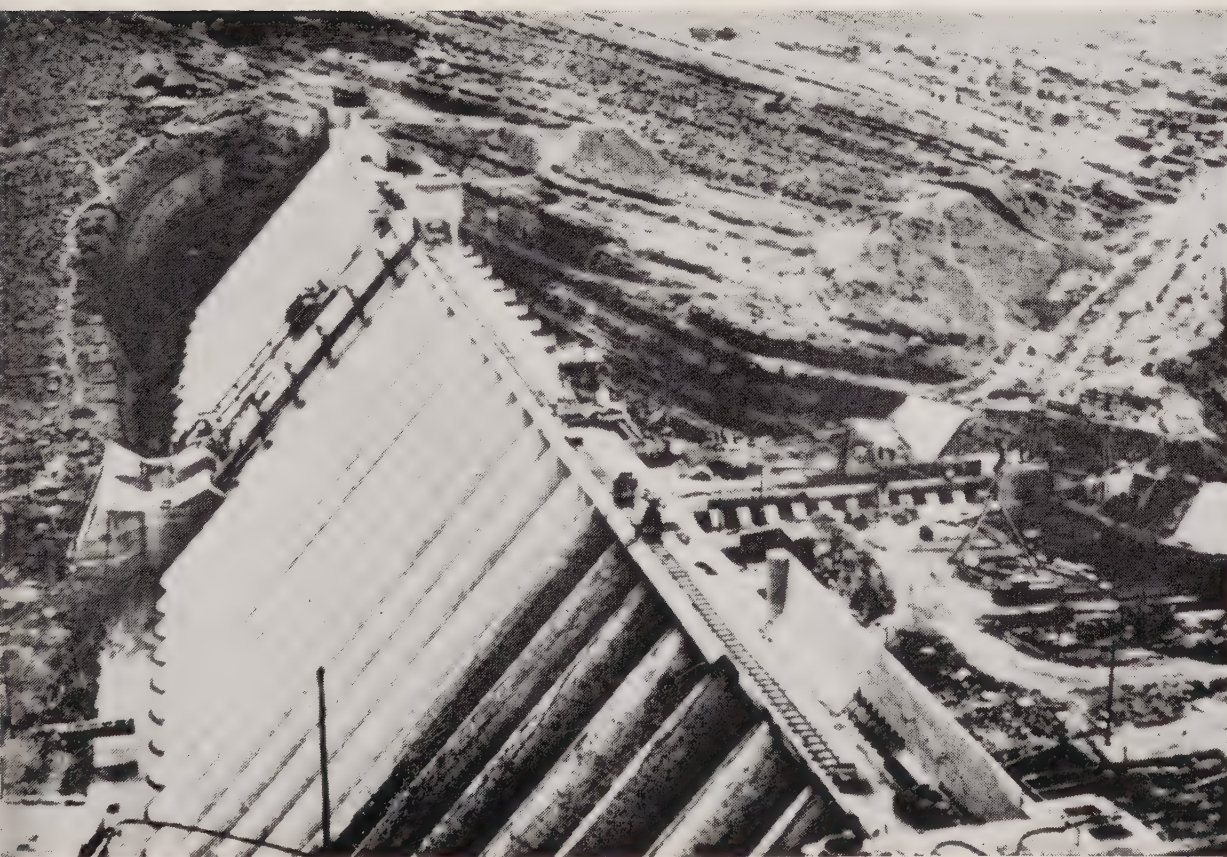
Cereals

Much of the cultivated land of northern Algeria is occupied by cereals, the production of which is possible in most districts. Even in the Sahara, barley and hard wheat are grown in the oases. The best cereal-growing regions are in the Tell near Tlemcen, Sidi bel Abbès, Mascara, and Médéa, and in the high plains of Constantine, particularly round Sétif, Constantine, and Guelma. In these districts the soil is fertile, and the climate is cooler than in the coastal regions. Yields are generally poor, because of the inefficient methods of cultivation; even the results obtained by Europeans, which are usually 30 per cent. or more above those of the natives, are only about half those obtained in England. Yields could be greatly increased by the application of fertilizers and the selection of seed.

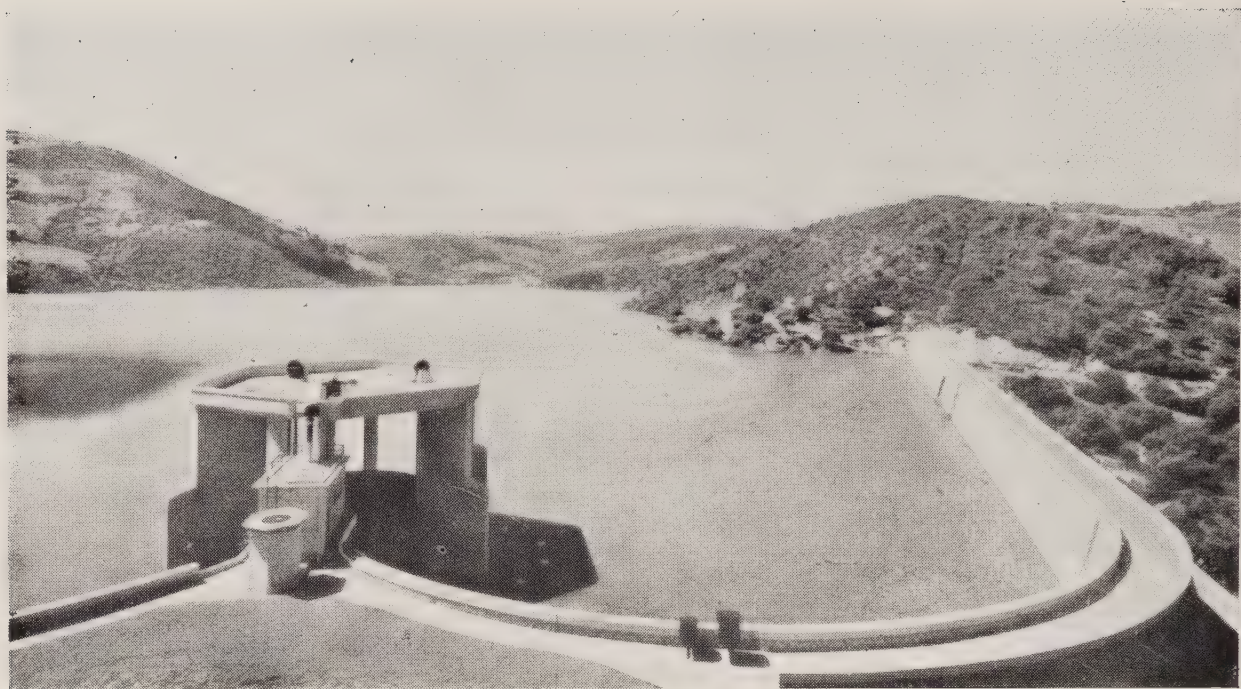
With the help of dry farming and irrigation new areas farther south



41. *Ghrif dam*



42. *Oued Ksob dam*



43. *Oued Hamiz dam*



44. *Lake held up by Oued Hamiz dam*

have been brought under cultivation in recent years. These have, however, done little more than maintain the country's total production, which would have decreased without them, partly owing to soil exhaustion, but mainly because of the use of the best land in the north for vine-growing and market-gardening rather than for the growing of cereals. One of the main difficulties of the cereal farmer in Algeria is his dependence upon the French market, which takes the bulk of the surplus crops. Competition with large-scale producers like Canada and the Argentine is impossible, and the price and

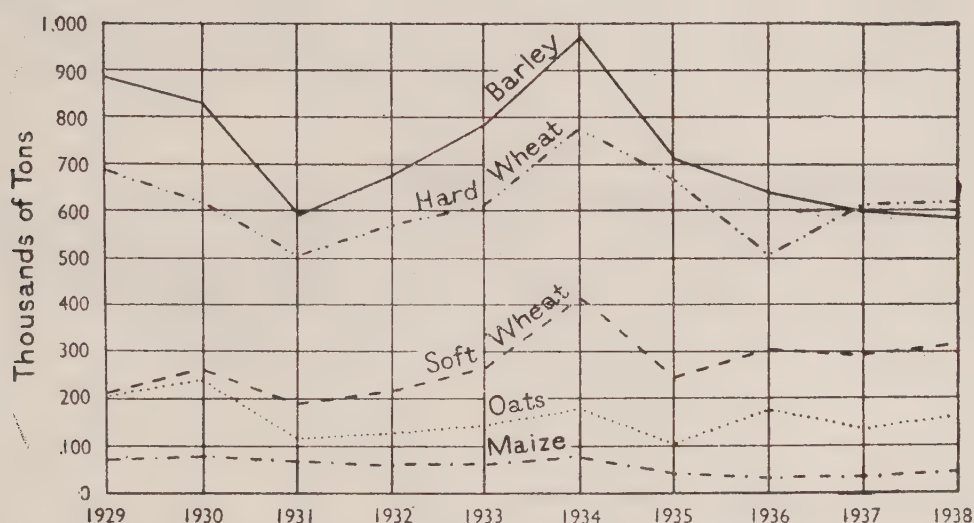


FIG. 49. *The production of cereal crops, 1929-1938. Owing to small production the figures for maize are exaggerated ten times (i.e. are given in thousands of quintals)*

demand are very largely determined by the nature of the harvest in metropolitan France each year. An attempt to regulate the market by storing surplus grain has been made in recent years, and numerous silos have been built for this purpose.

The natives are the main producers of cereals and account for about 75 per cent. of the total area under cultivation. Europeans farm land in all the cereal-growing regions, especially in the Tell. There are two types of cereals: winter crops of hard and soft wheat, barley, oats, and rye; and summer crops of maize, sorgho, and millet, which are of little economic importance.

Table I of Appendix A gives the area and production figures for cereals from 1929 to 1938, and Table II the production figures (by arrondissements) for barley, wheat, oats, and maize for 1937. The fluctuations in the production of the main cereals between 1929 and 1938 are shown in Fig. 49. In recent years the area under cereals has remained more or less stationary; in 1939 there were 7,775,000 acres

(3,110,000 hectares), nine-tenths of them under wheat and barley. The estimated yields for the 1942 harvest were: wheat 820,000 tons, barley 700,000 tons, and oats 160,000 tons. As in other parts of French North Africa, harvesting has been difficult since the outbreak of war because of the shortage of fuel for agricultural machinery and transport, and also because of the bad state of repair of tractors owing to lack of spare parts. It has also been difficult to obtain sufficient labour, in spite of increased wages.

Barley. Barley is cultivated throughout northern Algeria where the rainfall exceeds 13 inches per annum, but the chief areas are on



FIG. 50. *The distribution of barley. This and Figs. 51, 53, 55, 57, 58, and 59 show the chief areas of production in a normal year*

the high plains of the department of Constantine and in the Mostaganem district (Fig. 50). In 1937 the arrondissements of Constantine, Sétif, and Mostaganem¹ provided nearly half the total production of 598,100 tons. There is a greater area under barley than under either hard or soft wheat, since barley is extremely hardy and will thrive in places which are too dry for wheat. On the High Plateaux its early maturity helps it to resist the drought of summer. It is almost entirely grown by the natives, and is, with hard wheat, their most important cereal, since it gives a big yield, is comparatively easy to grow, and is assured of a local market. In Kabylie it is the main source of food. A large proportion of the crop is exported to the United Kingdom and France for brewing, for which it is particularly suited, and some is sent to breweries in Hussein Dey, Oran, Philippeville, and other towns. It is also used for fodder, being cut three times a year

¹ The arrondissement of Mostaganem referred to in this chapter is the arrondissement as it existed prior to the decree of 1938 which modified its boundaries considerably through the creation of the new arrondissement of Tiaret (p. 9).

for this, at the end of December, February, and April. The bulk of the crop is consumed locally for human food known as *galettes* or for animal feed (green or in grain). The acreage has in general decreased in recent years from 3,692,500 acres (1,477,000 hectares) in 1930 to 3,100,000 acres (1,240,000 hectares) in 1939. Production figures have shown a similar decline, apart from the exceptionally good harvests of 1934 and 1939. The 1941 crop was estimated at 697,000 tons, and that of 1942 at 700,000 tons. There is normally a surplus available for export (17,877 tons in 1938).

Wheat. In Algeria two types of wheat are grown—hard wheat, which occupies the larger area and is usually produced by the natives,



FIG. 51. *The distribution of wheat*

and soft wheat, generally grown by the European farmers. The best quality wheat is produced in the department of Oran, especially round Sidi bel Abbès, but also on the plateaux of Sersou and Tiaret, on the high plains of Mascara, and in the valleys of the Oueds Tafna and Chélif; and in the department of Constantine round Souk Ahras, on the plains of Sétif and the Medjana, and in the neighbourhood of Bordj bou Arréridj (Fig. 51). The largest producers are the arrondissements of Constantine (175,134 tons in 1937), Mostaganem (105,635 tons), Sétif, Miliana, and Sidi bel Abbès.

Hard wheat is used mainly for food, and any surplus is manufactured into spaghetti and macaroni. It is grown on the high plains of the Tell and on the slopes of the mountains, especially in the department of Constantine. The natives take little care with its cultivation and yields are low (cf. Appendix A, Table I). The native cultivator at present aims at quantity rather than quality, and the bulk of the harvest is used by him for food, but the gluten properties of the grain make it eminently suitable for the manufacture of semolina and other food

pastes. In 1938 the production of hard wheat in northern Algeria was 623,400 tons from a cultivated area of 3,025,000 acres (1.2 million hectares).

Soft wheat, grown chiefly by Europeans, is of increasing importance. In 1938 northern Algeria produced 322,800 tons from 1,075,000 acres (430,000 hectares). The chief producing areas are in the department of Oran in the plains of Sidi bel Abbès and Oran, the plateau of Sersou, and the Chélif valley. It is harvested about six or eight weeks before the French crop, and the bulk of it is usually sent to flour-mills. The largest mills are in Algiers, Oran, Bône, Philippeville, and near Constantine (p. 256): there are also many smaller mills, and all the villages in the interior have small rudimentary native mills.

Owing to low world prices in some years and the relatively high cost of production in Algeria, metropolitan France bought foreign wheat in preference to Algerian, and a large part of the Algerian crop was left unsold. To avoid this, a decree of 21 September 1936 created an 'Office National du Blé', which controlled the sale of wheat, fixed the price, and helped growers by giving advances on the harvest.

Yields per acre have, in general, tended to decrease in recent years owing to the exhaustion of the land and the use of the more fertile soils for other and more remunerative crops, and total production has been maintained only by the use of new areas. Climatic conditions also have a marked influence on production: 18 inches of rain per annum are necessary for good crops, and a dry winter or spring—or too continuous rainfall in October for ploughing to be possible—inevitably leads to poor harvests.

In 1941 the soft wheat crop was estimated at 250,000 tons and the hard wheat at 630,000 tons; much of this was sent to metropolitan France. The corresponding estimates for 1942 were 240,000 and 580,000 tons respectively. Prior to the Allied occupation of the country, bread was not rationed and supplies were generally adequate, although there were occasional local shortages. The bread was of poor quality and contained a high proportion (sometimes as much as 60 or 70%) of barley flour.

Oats. Oats were introduced by Europeans in the middle of the nineteenth century, and are to-day grown almost entirely by the colonists, who in 1937 grew 110,696 tons out of a total production of 138,836 tons. The variety grown is known as *avoine rouge d'Afrique*; it is suited to newly broken land, and is not exacting as to soil conditions.

The department of Oran is the main producing area, the crop being

grown in the plains of Tlemcen, Sidi bel Abbès, Mostaganem, and Mascara. The crop starts to ripen as early as April. In 1937 the production of these arrondissements and of that of Oran accounted for 85,309 tons out of a total of 138,836 tons. In the department of Algiers the crop is grown especially in the Mitidja and the Miliana region, and in the department of Constantine near Constantine and in the plain of Bône. All these are also wheat- and barley-growing districts. The area under oats decreased from 1929 to 1935 and then increased slightly in 1936 and 1937, and again in 1939. Production and export figures vary considerably. Much of the crop is consumed in the country; the exports in normal times go mainly to Italy. In 1941 the estimated harvest was 116,000 tons, of which 6,200 tons were exported, and in 1942, 160,000 tons.

Maize. Unlike wheat, barley, and oats, maize is a spring-sown crop. It is grown only on the irrigated plains and the coastal plains, chiefly in the department of Constantine. The chief producing areas are round Bougie and Bône; in 1937 these districts accounted for 1,154 tons of the total production of 3,560 tons. Maize is also grown in the low irrigated plains of the department of Oran round Tlemcen, Perrégaux, and Relizane. At present the crop occupies only a small area (15,000 acres or 6,000 hectares in 1939), and production is slight, averaging only 5,500 tons per annum, and only reaching 7,400 tons at its highest in 1930. Algeria has to import maize, and 1,900 tons were imported in 1937. It seems, therefore, that the area could profitably be extended by the utilization of the new irrigation schemes described on pp. 203-204.

Rye. Rye is unimportant in Algeria. It is used to provide a wind-break for young vines, being planted between the rows in the vineyards. In 1930, 4,535 acres (1,814 hectares) were under rye, but this decreased until 1934, when production rose considerably to 1,145 tons, only to fall again to 441 tons in the following year. In 1938 4,621 acres (1,871 hectares) were devoted to rye and produced about 1,123 tons. The department of Oran produces the bulk of the crop, especially from the arrondissement of Mostaganem. In 1937 Mostaganem accounted for 2,852 acres (1,141 hectares) and 810 tons out of a total area of 3,245 acres (1,298 hectares), which yielded 941 tons.

Sorgho. This crop, known by the natives as *bechna*, used to be grown for food with the help of the spring rains, but the area has decreased, hard wheat taking its place in native cultivation and diet, and it is no longer important. It is grown in the cooler parts of northern Algeria, chiefly by the Kabylie people, particularly those

of the Tizi Ouzou district, and takes the place of other cereals of which they may be short.

Millet. Millet is a native crop grown on a very small scale in Algeria; in 1937 there were 1,297 acres (519 hectares) under the crop, 897 acres (359 hectares) being in the Territoires du Sud and the rest in the coastal districts of Kabylie.

Non-cereal Crops

Tobacco, cotton, and vegetables are the main non-cereal crops grown in Algeria, excluding fruits and alfa, described below. Peas and beans are produced chiefly for native food, and are grown all over the country, but the other crops are mainly for export, and their cultivation is local (Fig. 46).

Tobacco. Fine aromatic tobacco with little nicotine is the chief industrial crop grown in the country. In 1938 there were 16,313 planters, about two-thirds of them being natives. The growers have united in co-operative societies called 'Tabacoops', which regulate production and export. Before the French occupation Turkish tobacco was grown in Algeria, but now the plants are derived from American stock. The largest producing areas are in the Kabylie and Bône districts. Production in the department of Oran is unimportant as the soil is unsuitable. In 1933 there was a decrease in the area under cultivation, as the Tabacoops had been able to buy only 75 per cent. of the average crop for the previous three years. Since then the area has fluctuated from year to year, but shows little change on the whole, though there was a decrease in 1936 (Appendix A, Table III). In 1936 the main crops were grown in the arrondissements of Bône, Algiers, and Tizi Ouzou, and were 8,518 tons, 5,477 tons, and 1,968 tons respectively.

A large proportion of the crop is exported, about 75 to 80 per cent. going to France, and the remainder to Spain, French Morocco, and Belgium. It is exported either as tobacco leaf or as cigarettes, the former providing the bulk of the export (Appendix C, Table II). Some is now manufactured in the country (p. 259); the largest factories are in Bône, Bougie, Algiers, and Oran.

Some tobacco is grown for snuff in the mountains west of Bougie, in the Kerrata district in the Kabylie des Babors, near Sétif, Philippeville, and Constantine, and in the Souf oases.

Cotton. Many attempts have been made to grow cotton in Algeria, but have met with little success. The crop is at its northern limit, and is particularly susceptible to conditions of climate and trade.

It was first introduced about 1850 and was grown in the coastal plains of the Sig and Habra on irrigated land. By 1853 the area had increased from 272 to 875 acres (109 to 350 hectares), and this progress continued until 1872, when there was a slump in world prices, and the crop maintained itself only in the Sig and Habra districts. In 1906 new areas in the Chélif valley were planted, particularly in the Perrégaux and Orléansville districts, but not until 1923 was there any great increase in production. In 1932 there was a marked fall in prices owing to the economic crisis, and simultaneously a variety of boll-weevil entered the country from eastern Morocco so that production was low. In 1937 output rose again to 227 tons, of which 104 tons were exported. Cotton was in demand in France, and the French Government encouraged the people of Algeria to take up cultivation again. Georgian long-staple cotton is grown in the Sig and Habra plains and in the Chélif valley; the planters have established co-operative societies to deal with the selection of seed and the sale of the crop, and the 'Association cotonnière coloniale' has set up a ginning factory at St. Denis du Sig. But cotton is an expensive crop to grow in Algeria, irrigation is necessary, and suitable areas are limited: only when world prices are high is much cotton grown, in spite of the ready market in France.

Market Gardening. In the last twenty years there has been a rapid increase in the area under early vegetables, and growers have taken advantage of the fact that Algerian harvests are some weeks ahead of those of metropolitan France, though a fortnight behind those of French Morocco. The chief products are early potatoes and fresh vegetables such as tomatoes, carrots, artichokes, peas, and beans. In 1929 more than 10,000 persons were engaged in market gardening for early vegetables, which, with fruit-growing, is being increasingly developed owing to the uncertainty of the wine harvest. Cultivation is concentrated in a coastal belt between 3 and 6 miles wide stretching from Tipaza to Reghaia (east of Algiers), where climatic conditions are particularly favourable. Hedges of reeds are often planted to keep off the cool sea breezes. Light sandy soils, which warm quickly, are most suitable, but the crops are also grown on loams and alluvium. Production is usually in the hands of colonists cultivating small holdings.

Apart from this coastal belt, the chief areas of production are in the valley of the Oued Tafna near Tlemcen, the Plaine des Andalouses, the Sig plain, the Mostaganem district, the valley of the Oued Chélif, and the district round Miliana, the Mitidja plain near the Oued

Mazafran and in the valley of the Oued Hamiz, the valley of the Oued Chiffa, the valley of the Oued Sebaou north of Tizi Ouzou, the coastal plain south-east of Bougie, the Sétif district, the coastal plain around Philippeville, and the valley of the Oued Seybouse and the coastal plain near Bône (Fig. 46).

In the early days of French colonization many of these regions were the best cereal-producing districts, but in recent years the farmers have tended to turn to market gardening, taking advantage of the mild winters, good soils, and proximity to well-equipped ports.

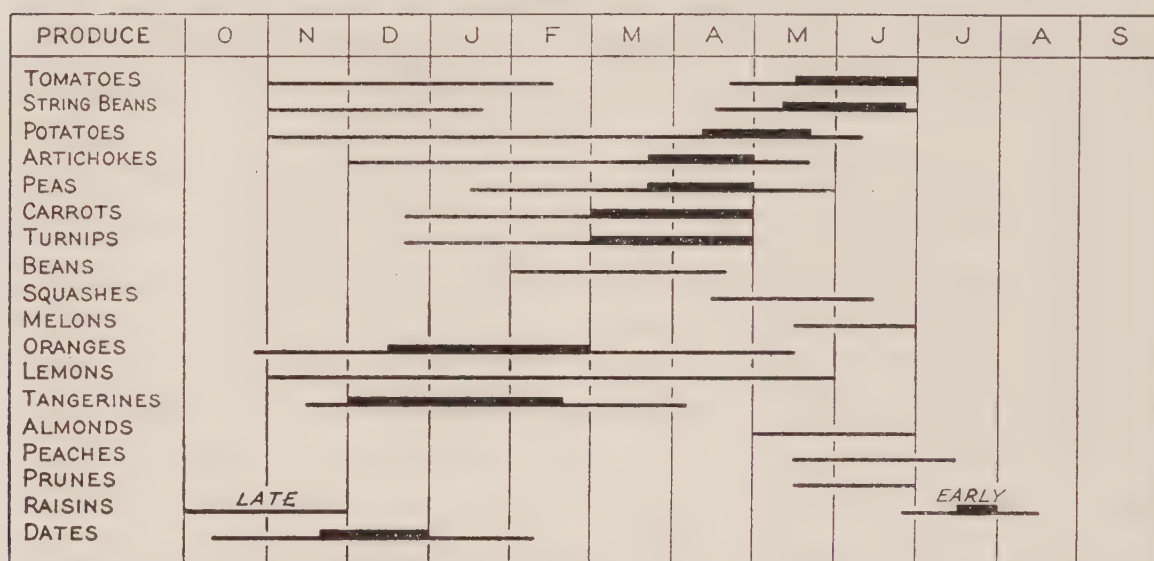


FIG. 52. *The cropping seasons of early vegetables and fruits. The thicker lines indicate periods of heaviest production. Squashes are pumpkins*

Early potatoes are grown almost entirely in the district round Algiers, particularly in the Sahel. The crop is easy to market, as the season extends from November to June, with maximum production in March and April; Spain begins to compete only in April. The later potatoes are used for local consumption. The area under potatoes decreased until 1934 but has since increased again, and production has risen in proportion (Appendix A, Table III). In 1937, 45,000 acres (18,000 hectares) were growing potatoes, and produced more than 130,000 tons, of which nearly 79,000 tons were exported.

Tomato-growing has shown the greatest increase in the last few years. Four-fifths of the crop comes from the district round Algiers, and there is no competition for the French market with Spain, the other important producer, as the Algerian crop is in season from November to mid-June, whereas the Spanish tomato crop is not ripe until mid-June. In 1936, 1,700 tons were exported.

Other vegetable crops produced for export include globe artichokes (19,600 tons exported in the 1938-1939 season), carrots (20,800 tons), beans (6,100 tons), and green peas (4,200 tons). Artichokes and peas are grown especially in the Perrégaux and Oran districts, and beans on the coast to the east of Algiers. About 20,000 tons of beans are also grown annually by the natives for their own use, either green or dried, before the cereal crops are ready. Peas are another source of food, and egg-plants, turnips, red and green peppers, and vegetable marrows are grown.

France is the chief importer of Algerian produce, the Spanish Civil War having increased the proportion bought from Algeria. Half of all the imported fresh vegetables consumed in France in 1938 came from Algeria, 82 per cent. of these coming from the Sahel of Algiers. Before the present war Algeria was attempting, with French Morocco, to extend its market in the United Kingdom, Belgium, and Germany. Co-operative societies were formed to promote and organize production and sale, and to supervise drying and packing. Road and rail communications were improved, and fast ships linked Algerian and French ports so that vegetables leaving Algiers on a Wednesday reached Paris for sale on Saturday, and Germany on Sunday.

Exports of vegetables begin in January and the most active period is from March to May. Fig. 52 shows the months during which the principal market-garden products are exported. The quantities exported are given below.

Exports of Early Vegetables (tons)

	1935-1936	1936-1937	1937-1938	1938-1939
Globe artichokes.	23,100	38,200	16,200	19,600
Beans	7,400	6,800	10,800	6,100
Carrots	13,000	9,200	9,800	20,800
Green peas.	4,200	4,500	3,500	4,200
Potatoes	73,000	80,000	78,000	60,200
Tomatoes	16,800	20,000	20,900	17,200

The area under cultivation for dried vegetables has dropped steadily from the 1929 figure of 225,000 acres (90,000 hectares), and, as a result, Algeria has had a smaller share of the French import trade in dried vegetables than might be expected. Production figures by arrondissements in 1937 are given in Appendix A (Table IV).

Fruits

Of the many kinds of fruit grown in Algeria the chief are oranges, lemons, tangerines, grapes, olives, figs, and dates; apples, pears, plums,

cherries, almonds, medlars, walnuts, and chestnuts are of secondary importance. Unfortunately the native methods of cultivation are careless; the trees are given no support, the fruit is beaten down and often bruised at harvest time, and there is no selection of varieties. The natives are generally unwilling to establish plantations for the outside market, as they cannot afford to wait several years while the trees become productive. Commercial fruit-growing is, therefore, mainly in European hands.

Vines (Photos. 47, 48). The principal commercial fruit 'tree' is the vine, which is especially adapted to stand dry summer conditions. It is

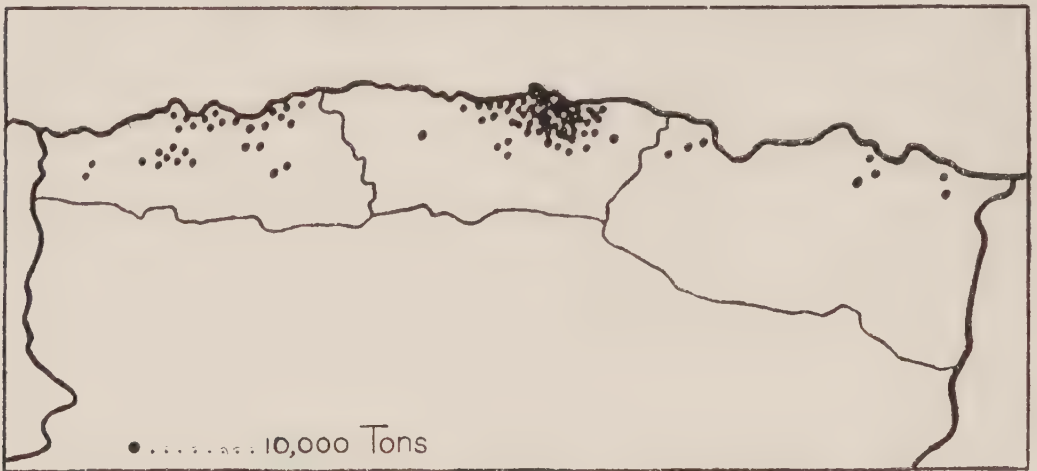


FIG. 53. *The distribution of vines (grape production)*

limited to a belt about 65 miles wide along the coast; farther inland the drying effect of the sirocco hinders its growth. Within the coastal zone there is a direct connexion between the distribution of vineyards and of European settlers, there being most vines in the areas most densely colonized. As a result the area under vines is very unequally distributed between the three departments; in 1936 there were 622,500 acres (249,000 hectares) in Oran, 312,500 acres (125,000 hectares) in Algiers, and only 65,000 acres (26,000 hectares) in Constantine.

Grapes were grown before the French occupation, though only on a comparatively small scale, since the Koran forbade the drinking of wine. Since 1830 the area under vineyards has increased steadily, particularly when, between 1865 and 1870, phylloxera attacked the French vines and led to the emigration of many growers to Algeria. When in turn the colonists' vines were affected, American stock was imported, and the increase in area continued. In recent years nearly 1,000,000 acres (400,000 hectares) have been devoted to vines (Appendix A, Table III). This figure is unlikely to be increased in the

immediate future, since a decree of 8 July 1933 designed to regulate production prohibited the establishment of any new vineyards.

Vine cultivation is admirably suited to Algerian conditions, and scientific knowledge has adapted French methods of wine production to the warmer conditions of the country. Both cultivation and wine-making are now very efficient. The chief producing areas are Tlemcen,

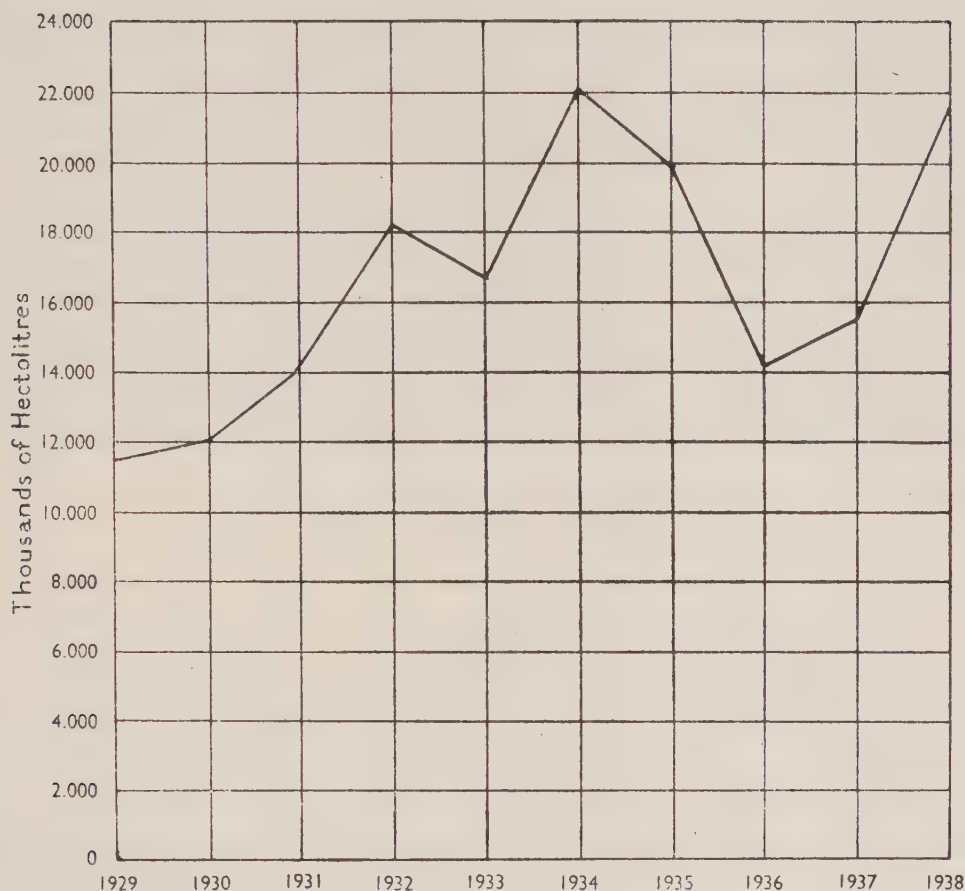


FIG. 54. *The production of wine, 1929–1938. One hectolitre is equal to 22 gallons*

Ain Témouchent, Oran, Mostaganem, Sidi bel Abbès, Mascara, St. Denis du Sig, the Sahel (the principal region in Algeria), the Mitidja (which produces high-quality wines in the east and ordinary wines in the west), Miliana, Médéa, Bougie, Djidjelli, Philippeville, Bône, and Souk Ahras (Fig. 53). In 1937 the arrondissement of Algiers produced 95,216 gallons of wine (4.3 million hectolitres), Oran 88,396 (4 million hectolitres), Mostaganem 49,720 (2.3 million hectolitres), and Sidi bel Abbès 26,730 (1.2 million hectolitres) (Appendix A, Table V). Production figures for the years 1929–1938 are shown in Fig. 54.

Although the vine is grown principally for the production of wine,

which accounts for 60 per cent. of the value of all Algeria's agricultural exports, grapes also are exported (7,098 tons in 1937), particularly a fine white variety grown in the sands and red soils of the Algiers district at Guyotville, Staouéli, Zéralda, and Chéraga, and harvested as early as the last week in June. The main variety is the Chasselas de Guyotville, the first plantations of which were established at Guyotville in 1867.

Before the war wine was exported solely to France (p. 281), but some part of the harvest has always been made into alcohol; during the War of 1914-1918 an increased proportion was put to this use, owing to the difficulties of obtaining supplies from overseas. The possibility of distilling alcohol is, however, governed by coal supplies. The French North African crop of 1941 was estimated to yield 132 million gallons (6 million hectolitres) of wine or 14,520,000 gallons (660,000 hectolitres) of alcohol. Wine production does not depend solely on conditions in the country, the French harvest largely determining the price of the Algerian crop. Thus when there is a good yield in France, as in 1893, 1901, and 1906, it is impossible to export large quantities from Algeria. The country is, therefore, forced to concentrate on highly alcoholic stock, supplying the French deficit of medicinal and blending wines rather than table wines. In 1934 the harvest was very good in France, and although there was an exceptional crop in Algeria, exports were restricted to 264 million gallons (12 million hectolitres). In contrast, although only 310,794,000 gallons (14,127,000 hectolitres) were produced in 1936, climatic conditions were bad in France too, and 237,336,000 gallons (10,788,000 hectolitres) were exported, nearly all to France.

Olives (Photo. 46). The olive will grow on light calcareous soils and in poorly watered districts suitable for little else. It is found chiefly in a belt between the coast and the steppes of the High Plateaux to a depth of about 65 miles: it occurs particularly on the hill slopes between 1,000 and 2,000 feet above sea-level (Fig. 55). It does not grow on the High Plateaux. Olives are consumed in large quantities by the natives, especially the Kabylies. There are about 5 million wild trees, and 9 million cultivated (planted or grafted), of which 7 million are bearing, and of these the natives own 4 million and Europeans 3 million. The principal centres of production are in Kabylie, particularly near Tizi Ouzou, and around Bougie and Algiers. Yields differ considerably, as shown by the following figures, which reflect the poorer methods used by the natives, as in the arrondissement of Tizi Ouzou (cf. Appendix A, Table V).



45. *Native plough, Kabylie*



46. *Gathering olives, Kabylie*



47. *Vineyards, Ain Témouchent*



48. *Sulphur-spraying in vineyards*

Production of Olives and Olive-oil, 1937

<i>Arrondissement</i>	<i>Olive trees</i>	<i>Olives (tons)</i>	<i>Olive-oil</i>	
			<i>(gallons)</i>	<i>(hectolitres)</i>
Algiers . . .	1,273,000	16,081	370,502	16,841
Bougie . . .	2,794,000	17,842	541,068	24,594
Oran . . .	419,000	5,946	132,770	6,035
Tizi Ouzou . .	1,477,000	2,075	61,776	2,808

Many of the trees are carelessly cultivated. There is often no manuring or pruning, and, when ripe, the fruit is sometimes beaten down with sticks, thus damaging the trees. The oil, in many cases, is



FIG. 55. *The distribution of olives*

made in primitive ways, the fruit being crushed by foot in little basins called *ahadoun*, or in old-fashioned presses (Vol. I, Photo. 58). Europeans own such mills as there are.

The chief areas in the department of Oran are round Oran, Tlemcen, and Sidi bel Abbès; in the department of Algiers round Palestro, Tablat, Blida, and Ain Bessem, in addition to the Algiers district; and in the department of Constantine the Bougie district, the Soummam valley, and near Bône, Philippeville, Batna, Tébessa, Guelma, Constantine, and la Calle. The crop varies from year to year, as shown by the following figures and by those in Appendix A (Table III):

<i>Year</i>	<i>Area cultivated¹</i>		<i>Production</i>	<i>Production</i>	
	<i>(acres)</i>	<i>(hectares)</i>	<i>Olives</i>	<i>Olive-oil</i>	
			<i>(tons)</i>	<i>(gallons)</i>	<i>(hectolitres)</i>
1934	170,000	68,000	81,700	2,002,000	91,000
1935	172,500	69,000	122,800	3,542,000	161,000
1936	177,500	71,000	110,700	3,146,000	143,000
1937	205,000	82,000	62,700	1,584,000	72,000
1938	202,500	81,000	138,100	3,850,000	175,000

¹ These figures include only areas of dense plantations (at least 20 trees per acre), which account for rather more than half of the total number of trees.

Large quantities are exported (24,381 tons in 1938), mainly to France. Attempts are being made to develop the export of preserved olives and to find new uses for the oil.

Figs. There are about 7 million fig trees in Algeria, chiefly in hilly regions such as Kabylie, where the districts of Tizi Ouzou and Bougie produced 23,422 tons and 27,694 tons respectively in 1937 (Appendix A, Table V). Figs are grown chiefly for consumption by the natives, who own most of the trees, which are cultivated very carelessly. There is usually a surplus for export.

Citrus Fruits. Citrus fruits are grown, almost entirely by Europeans, on the coastal plains where the temperature is high and irrigation is possible. Oranges are the chief crop, but tangerines, lemons, clementines (a cross between oranges and tangerines), and citrons are also grown. The main centres of orange cultivation are in the Mitidja (Blida and Boufarik) (Vol. I, Photo. 6), around Koléa in the Sahel, Relizane, in the neighbourhood of Oran (especially Misserghin, which has very dense groves), and round Philippeville and Bône. In 1937 the arrondissement of Algiers produced 18,701 tons of oranges and that of Oran 11,590 tons, out of the total of 50,600 tons (Appendix A, Table V). The harvesting period for oranges is from October to May with a peak production period from mid-December to the end of February (Fig. 52). The production of lemons, oranges, and tangerines in 1935 was respectively 3,400 tons, 35,000 tons, and 34,500 tons, and in 1938 these figures had risen to 4,000 tons, 51,600 tons, and 48,500 tons.

Cultivation of citrus fruits is hindered by competition from Spain and Italy, and by the high costs of packing and transport, but the fruit, whether fresh, dried, or preserved, forms a valuable export, amounting in 1938 to 128,982 tons, 98 per cent. of which went to France.

Dates. The date palm belongs to the oases of the south. It has always been an important source of agricultural wealth in Algeria, especially in the Territoires du Sud. It serves many purposes for the natives: its leaves make baskets, mats, and other articles; its wood is used by the carpenter and its fibre is used for rope; other fruits, vines, cereals, and vegetables are grown under its shade; and it provides a staple food. For satisfactory growth it needs plenty of subterranean water, a hot climate, and dry air. The best date palms of the Sahara are found in two groups of oases in southern Algeria: the first consists of the oases of Gourara, Touat, and Tidikelt, and the second of the oases of Ouargla, the Oued Rir, and the Ziban. Of

the total of 105,621 tons of dates produced in Algeria in the season 1936-1937, only 11,753 tons were grown in the northern departments.

Three main types of dates are produced: *ghars*, a sweet, soft fruit difficult to export, grown and eaten mainly by the natives; *degla-beida*, a dry type eaten mainly by the natives; and *deglet-nour*, a very fine variety produced for export. Production figures are given in Appendix A (Table III). In 1937, 53,802 tons of *ghars*, 38,480 of *degla-beida*, and 13,339 of *deglet-nour* were produced. The dates are sent to Marseilles, whence a large quantity goes to England. In 1937, 10,133 tons were exported from Algeria, but the cost of transport from the south is so great that it is often cheaper on the coast to buy dates imported from Iraq.

Other Fruits. Other fruits of less importance are grown in Algeria, and experts have been sent to California to study the possibilities of introducing further varieties. In the fertile coastal plains, especially the Mitidja, almost any kind of fruit can be grown. Pear and apple trees grow in the coastal districts, but generally do better on the high lands of the Tell, although the sirocco is at times harmful. Cherry trees grow best in the interior and at high altitudes, particularly at Miliana, around Beni Slimane, and at Tlemcen. Walnuts grow in the Kabylie country and chestnut trees on Djebel Edough. Apricots grow well in northern Algeria, in the valley of the Oued Chélif and in the neighbourhood of Constantine, which is renowned for its small, but delicately flavoured, fruit. A preserving industry is developing, centred at Orléansville, Relizane, and elsewhere (p. 259). Almonds are suited to the drier districts, but are little grown. Plum trees thrive in this climate, and the Japanese plum-tree has been planted with success in the Mitidja, and a dwarf orange, known as *kumquate*, has also been grown there. Some attempt has been made to grow carob beans and pomegranates, and there are a few bananas in sheltered coastal districts. Japanese medlars are extensively grown in the neighbourhood of Algiers and provide the first spring fruit for the local markets.

Alfa

Alfa (esparto grass) grows over about 15,700 square miles (4 million hectares) in Algeria, and is the basis of a considerable export trade (cf. p. 260). It grows most densely in the High Plateaux of the department of Oran, where it also stretches as far north as the coast (Fig. 46; Vol. I, p. 148 and Photo. 50). In the department of Algiers it occurs only south of a line through Tiaret, Teniet el Had, Aumale,

and the Biban, and in the department of Constantine south of Maadid, Bou Thaleb, the northern Aurès, and Tébessa. It grows in tufts 2 to 3½ feet high with leaves 1½ to 3 feet long and about half an inch wide. There are two varieties, the white or fine alfa, which grows best on limestone soils with not more than 25 inches of rainfall a year, and the green or coarse alfa, which is less resistant, and grows to greater heights and often in damp, clayey depressions. The leaves are gathered by pulling by hand, not cutting; several leaves are gathered at a time, but never more than eight or ten (Photo. 49). Gathering is forbidden from the end of December to the beginning of spring when the new leaves begin to sprout. Alfa is used locally to make baskets, ropes, sandals, and, when well cleaned and combed, for carpets and cloth. Over nine-tenths, however, are exported for the manufacture of high-quality paper, the fibres being treated with a mixture of cellulose and straw. Just over two tons of alfa are required to make one ton of paper-pulp. Alfa was first exported in the department of Oran by the Spanish, but because of its small value in relation to its bulk, it is remunerative only when fairly near a railway line. About 90 per cent. of Algeria's production goes to the United Kingdom, over 200,000 tons being exported in some years (p. 282).

Livestock

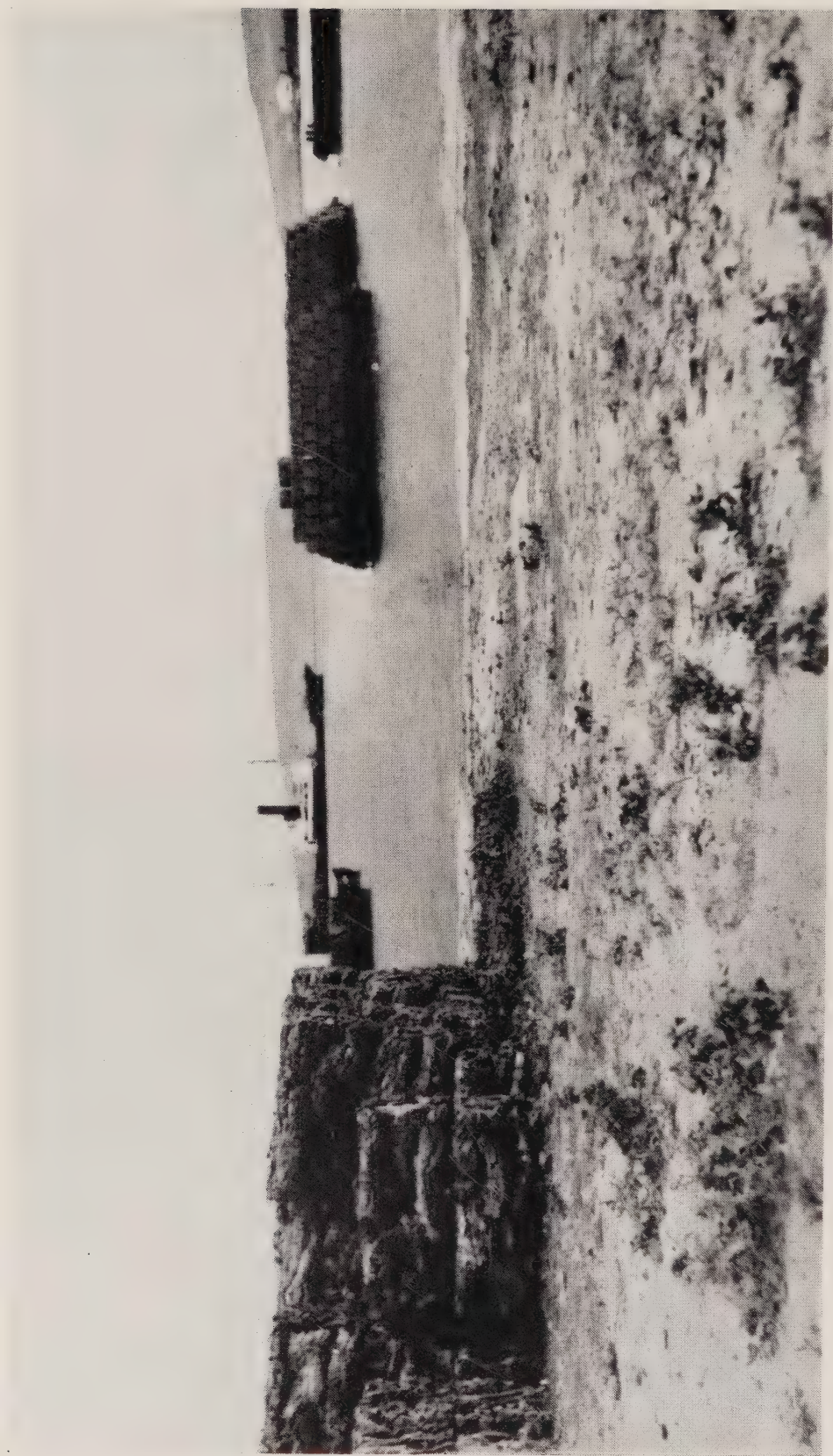
Before the French occupation in 1830 animals were grazed over all the best lands of the coastal as well as of the steppe districts, but quality was poor, wealth being measured in quantity. The animals were given little attention, though they generally managed to find enough food. With the exception of the pig, stock is still reared mainly by the natives.

European colonists have settled principally in the Tell, and are occupied in arable farming and particularly in vine-growing. The lands which they farm are those which formerly provided the best natural pasture, and the natives, with their sheep and cattle, have, therefore, been forced to retreat inland. Wandering herdsmen often used the pastures of the coast to supplement those of the interior, and when cut off from a part of their grazing lands were forced to settle in permanent villages and reduce their flocks and herds. Some sought additional pasture by letting their animals roam in the forests, but again interests conflicted because the sheep and goats damaged the trees which were needed for other purposes.

Most of the European colonists are unwilling to turn to stock breeding, because arable farming, vine-growing, and market gardening



49. *Gathering alfa*



50. Cork stacked for shipment, Djidjelli

give quicker returns. In 1938 they owned only 14 per cent. of the sheep, 6 per cent. of the goats, and 12 per cent. of the cattle.

It is difficult to induce the natives to improve their stock and methods. The animals are grazed on waste or fallow land and commons, and there is little natural pasture: as yet fodder is rarely grown, and when it is cultivated is grazed off instead of being harvested and fed to the stock as required. No shelter is provided, and consequently deaths from exposure to excessive cold in winter or drought in summer are common. There is no surplus of food in bad years, and epidemics spread rapidly amongst the weakened flocks and herds in dry summers. Attempts are now being made to improve the situation by encouraging the cultivation throughout the Tell of fodder crops such as Alexandria clover, lucerne, and beet. The agricultural research stations are experimenting with crops which could be grown in the fallow year to enrich the ground for the following cereal. The irrigation schemes make possible the growth of some meadowland, from the best of which five to eight cuttings of hay can be made in the year. The building of silos has been introduced so that hay can be stored for bad years. Increase in the acreage of fodder crops is slow, but their cultivation should do much to check the decrease in stock and the variations due to bad climatic conditions. At the same time varieties are being improved by cross-breeding: the small native cow has been crossed with French stock, and the mares with Breton stallions, and the rearing of the poorer types of sheep has been discouraged. Refrigerator plants have been introduced at Algiers and Maison Carrée, and means of transport with metropolitan France have been improved, so that produce could be marketed more expeditiously in peace-time.

The variations in the numbers of sheep, goats, cattle, and camels in the country between the years 1929 and 1938 are shown in Fig. 56. Table VI of Appendix A gives the number of all types of livestock from 1928 to 1937, and Table VII the distribution (by arrondissements) of sheep, cattle, horses, mules, and asses in 1937. The chief stock-rearing arrondissements are Constantine, Mostaganem, and Batna. The estimated figures for 1942 were as follows:

Sheep . . .	6,000,000	Mules . . .	160,000
Goats . . .	3,000,000	Asses . . .	280,000
Cattle . . .	700,000	Camels . . .	130,000
Horses . . .	150,000	Pigs . . .	90,000

Sheep. In 1887 there were 10 million sheep in the country, but by 1930 the number had dropped to 4 million, and to-day it is about 6

million. The decline is due for the most part to the extension of cultivation in the Tell and the steppes, and the consequent reduction of common pasture. Attempts are being made, as mentioned above, to provide fodder crops and artificial grazing, and in this way, and by the sinking of new wells and the enclosure of pastures, the numbers could probably be considerably increased.

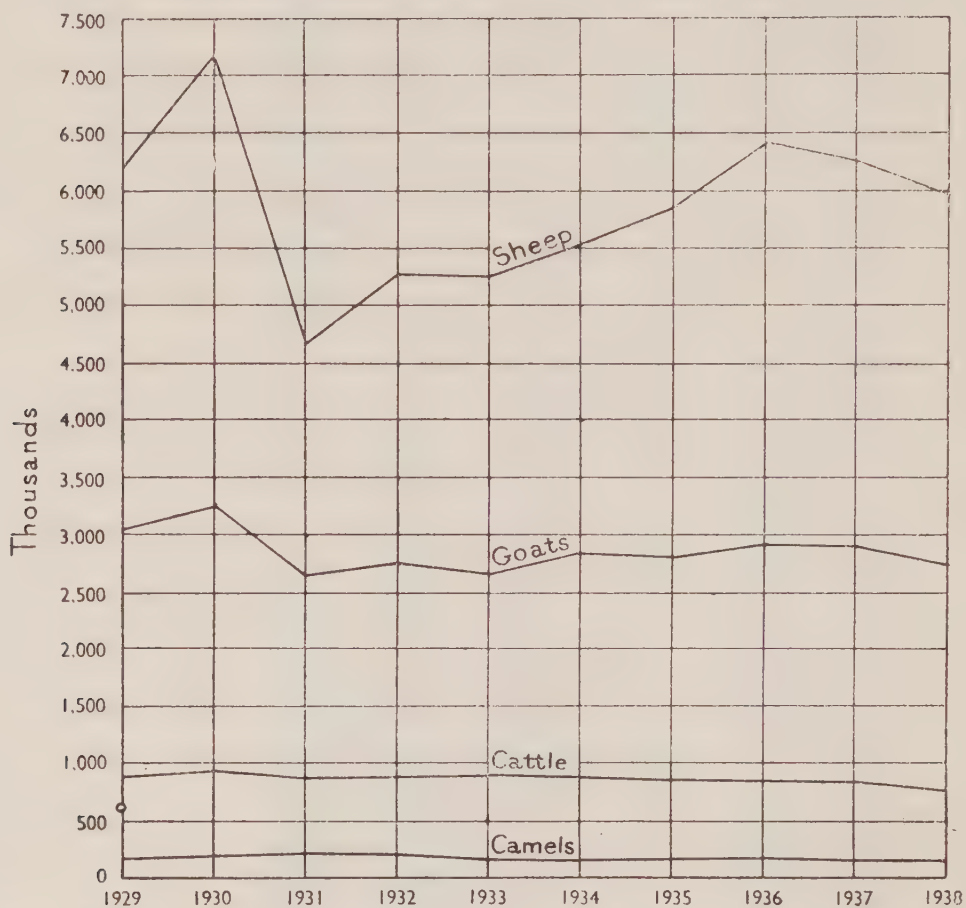


FIG. 56. *Number of livestock, 1929-1938*

The steppe lands of the High Plateaux and plains with their short, rather poor grass, are now essentially the sheep-rearing lands, especially the high plains of the department of Constantine (2,280,000 sheep in 1938) (Fig. 57). Even the Territoires du Sud have large flocks, which manage to exist on the scanty pasture. The annexe of Ain Sefra has most sheep (999,414), followed by the arrondissement of Constantine with 832,667 in 1937. Until the spread of cultivation restricted the available land sheep stayed in the south only in the winter, and in summer, when the pasture was withering, grazed their way along recognized sheep walks to the greener areas of the Tell. On the steppes the grass grows after the winter rain and is green for about a month; the sheep still eat it when it is dried up and

known as *el haschar*. They then graze on woody and salty plants, such as artemisia and atriplex, until they are moved north. The tribes are nomadic, moving with their flocks to the summer pastures; the Ouled Sidi Cheik, Hamyan, and Trafi peoples go north into the department of Oran, the Ouled Nail and Larba to the southern part of the department of Algiers, and the peoples of the Aurès to the Biskra region. The flocks of the Tell move too, but on a smaller scale; during the winter, for example, they are kept in the lower regions of the Djurdjura, but as summer advances they go higher up the slopes to the better pastures, known by the Kabylie peoples as

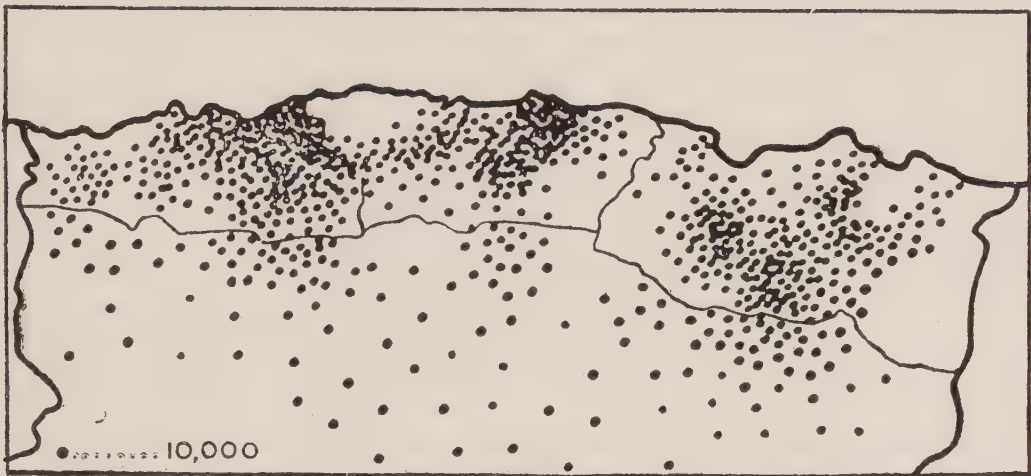


FIG. 57. *The distribution of sheep*

agounis (Vol. I, p. 38). In bad years they have to be allowed into the forest regions of the north, but do incalculable damage to the trees and undergrowth. In many places the lower slopes of the hills are bare of trees, which have been destroyed by flocks in their annual migrations.

There are three kinds of Algerian sheep: the long-tailed sheep of the eastern part of the department of Constantine (*barbarin*), which gives poor meat disliked by Europeans; the Berber sheep of the remote mountain districts, which yields poor meat and wool; and, most important of all, the Arabian sheep, which lives on the steppes and the plains. There are two varieties of Arabian sheep: a black-faced sheep in the south, and a white-faced type in the north; their wool is short, and more or less fine, and their meat is usually good. It is very difficult to improve varieties because most of the breeding is in the hands of natives: Europeans, particularly in the department of Oran, do not rear stock themselves, but buy sheep from the natives in the autumn, to fatten them during the winter and spring in the

Tell before selling them. Europeans are, however, beginning to be interested in stock rearing in the districts on the edge of the Tell, such as Sersou and the slopes of the Ouarsenis.

From October to April the sheep are grazed, gradually moving northward towards the ports, where they usually arrive in poor condition. The export is mainly of live animals. Refrigeration has been attempted, but owing to the short journey to France it has proved more successful to fatten the animals near the coast and export them alive. About 1 million head are usually exported annually (863,326 in 1938), three-quarters of them coming from the high plains of Oran and all of them going to France. The chief export seasons are spring and summer (especially in June and July). Meat and live animals are also imported into the country (Appendix C, Tables II, III).

Algerian wool is coarse and uneven in length, and includes foreign matter, but some is of quite good quality and could be further improved by the introduction of mechanical shearing. The average yield of wool is between $2\frac{1}{2}$ and 3 lb. per sheep. About 94 per cent. of the total production is in the hands of the natives. The 7,093 tons of wool produced in 1937 included 1,171 tons from the arrondissement of Constantine, 849 tons from that of Mostaganem, and 2,021 tons from the Territoires du Sud. Production exceeded 20,000 tons in 1929 and 1930, but declined to 6,200 tons in 1934: it rose to 7,382 tons in 1936, and there has since been a slight decrease.

The wool from the same type of sheep varies according to districts. It is generally short on the High Plateaux and in the Biskra, Bou Saada, Djelfa, Boghar, Boghari, and Aflou districts. It becomes longer in the richer lands or where there is less seasonal migration. In Kabylie the wool is generally long, but very hard, straight, and coarse, with no elasticity. Both meat and wool could be improved by better selection of breeds and greater care of the stock. Regular dipping, and crossing with Spanish merino sheep, have had some success in improving the quality of the wool, and stations have been established at Tadmit, Ain el Hadjar, and Sidi Medjahed to study breeding; in the department of Constantine the Agricultural Institute at Berteaux is doing the same work.

Goats. The rearing of goats is almost entirely in native hands, only 6 per cent. being raised by Europeans. Little care is taken of the animals, many being left to run wild. They live on brushwood or on anything else that they can find. In 1903 there were 5 million, but

numbers have steadily decreased since then to 2,912,380 in 1937. They are fairly evenly distributed throughout the country with 563,648 in the department of Oran, 675,916 in Algiers, 966,220 in Constantine, and 706,596 in the Territoires du Sud (Fig. 58).

The largest number is in the south around Ain Sefra, where there are 376,603, and around Algiers (292,126), Batna (259,858), Mostaganem (241,085), Constantine, and Sétif. The hair, milk, meat, and skin of the goat are all used, mainly within Algeria. Goatskins are of considerable importance for export, and about half were sent to France in peace-time.

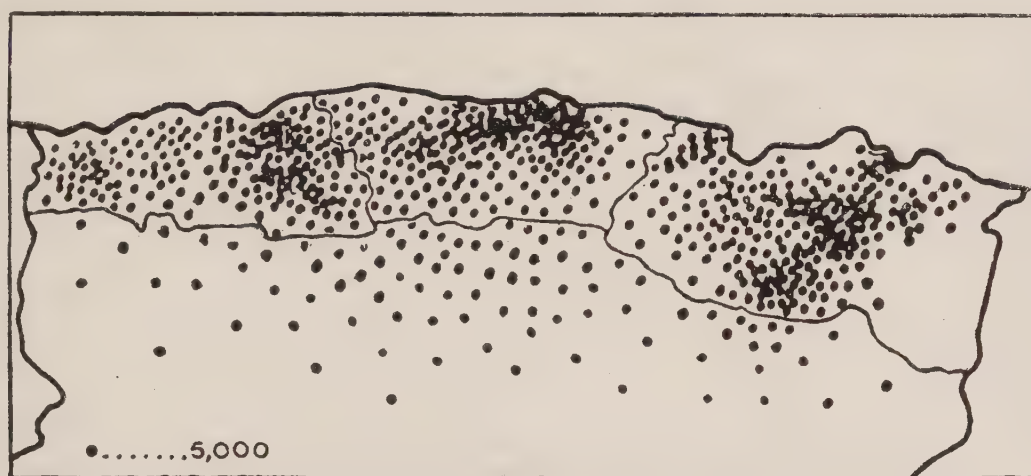


FIG. 58. *The distribution of goats*

Cattle. Cattle belong to the Tell, where there is plenty of water and rich grass (Fig. 59). Cattle breeding is limited, the pasture lands not being suitable for intensive breeding which alone is profitable. The animals are inferior to European breeds both in weight and in the quality of the beef. The number of cattle has declined considerably from 1,300,000 in 1856 and 1,127,577 in 1910 to 841,704 in 1937 and 789,000 in 1938. In 1937 the department of Constantine, with its heavier rainfall, had more (389,053) than either the department of Algiers (246,025) or Oran (183,320). In the Territoires du Sud there were 23,306. The chief cattle-breeding region is the plain of Guelma and Constantine, the Guelma breed being the best cattle in the country. They are hardy, docile, and very small, but strong, and they work well as draught animals, and give fairly good milk. Cattle are also common in the valley of the Oued Chélif near Médéa and Relizane. The cattle of the west generally grow larger and yield more meat than those of the east.

Only 12 per cent. of the cattle are owned by Europeans, and a large proportion of these is actually tended by native labour, so that

methods of rearing are on the whole careless, and the quality of the stock poor. The meat is poor because of the lack of good grass all the year round, the small amount of fodder crops grown, and the still too rare use of silos. Dairy cattle are few except around the large towns. Finer quality beef is often imported in preference to Algerian, although the production of the latter showed an increase from 13,800 tons in 1935 to 15,700 tons in 1937. No separate export figures for beef are available, but in 1936, 9,754 live cattle were exported.

Most of the butter and milk for Europeans has to be imported, chiefly from France, owing to the lack of suitable fodder for the cattle.



FIG. 59. *The distribution of cattle*

With the exception of goats' milk cheese, all cheese is imported, principally from Switzerland and France.

The cultivation of fodder crops, the better use of silos, the creation of irrigated meadows, and the development of mixed farming would help to increase the number and quality of the cattle. Attempts have been made to cross the native breeds with French stock, but little success can be expected until the question of feed has been solved.

Horses. The average number of horses varies between 170,000 and 185,000. The native Barbary horse is a small, but strong and hardy animal: it is comparatively well cared for by the natives, who own 71 per cent. of the total. Of the total of 185,375 in 1937, the department of Constantine had 70,222, followed by Oran with 65,349, Algiers with 39,607, and the Territoires du Sud with 10,197. They are bred chiefly in the region of Tiaret, and also in the neighbourhood of Ain Témouchent, Mostaganem, Relizane, Sétif, Constantine, and to the north of Batna. The army and private owners have tried to improve the breed by crossing it with French, English, Arabian, and Syrian stallions, but results have been disappointing: concentra-

tion on a selection of the best indigenous stock now appears to be the best policy. The export of horses in 1937 was 34,077, all of which went to France.

Mules and Asses. The mule is far more widely used than the horse both as a pack animal and for riding, especially in mountainous districts. It is easier to feed and is less delicate, and can be used after it is thirty months old. Mules are bred extensively, especially in Kabylie. There were 188,568 in the country in 1937 (82,661 in the department of Constantine, 62,091 in Oran, 41,238 in Algiers, and 2,578 in the Territoires du Sud), and it is estimated that over 20,000 mares are used by the natives. Mules are most common in the Sétif and Constantine districts.

Asses are found all over the country, and are mostly native-owned. They are used especially by the poor, carrying men and goods, and sometimes drawing carts and ploughs. Numbers have fluctuated in recent years between 279,000 in 1928 and 359,000 in 1936; in 1938 there were 319,000. They are particularly numerous in the arrondissements of Mostaganem, Algiers, Batna, and Constantine. Both mules and asses are reared chiefly for use within the country, the export being very small (985 mules and 209 asses in 1936).

Camels. In 1937 the Territoires du Sud possessed 145,018 out of a total of 172,906 camels in Algeria: in 1938 the total decreased to 170,000. Numbers will probably decline as more use is made of motor transport in the desert (cf. pp. 323-324). The natives own 99 per cent. of the animals, which they use for transport and for their hair, which is mixed with wool to make clothes and carpets. There are two varieties: the pack camel with a heavy step and powerful frame, and the famous riding camel, or *méhari*, which can travel long distances. Pack camels are at times overworked, and die from this cause and also from neglect.

Pigs. The pig is reared exclusively by Europeans, especially the Spanish: to the Moslems and Jews it is an unclean animal. There were 89,000 pigs in the country in 1929, but only 56,000 in 1937, mainly in the northern regions: the chief areas are the arrondissements of Oran (9,138), Algiers (8,527), Mascara (6,683), and Mostaganem (6,567). In 1936, 8,896 were exported alive; 4,200 tons of pork were produced, but no export figures are available.

Poultry. The natives rear large numbers of chickens, but they are of poor quality. They provide, however, enough eggs to supply the internal market, and a considerable amount is exported (3,070 tons in 1936).

Forestry

The regional description and general characteristics of the forests of Algeria have been given in Vol. I, Chap. V. To some extent the forests resemble those of Spain and Italy in that they contain a large number of evergreen species. In the past, devastating fires, excessive cutting, and overgrazing have greatly reduced their extent, and at least two-thirds of the forest area is poorly stocked with trees in a bad condition. In recent years the French forestry service has started

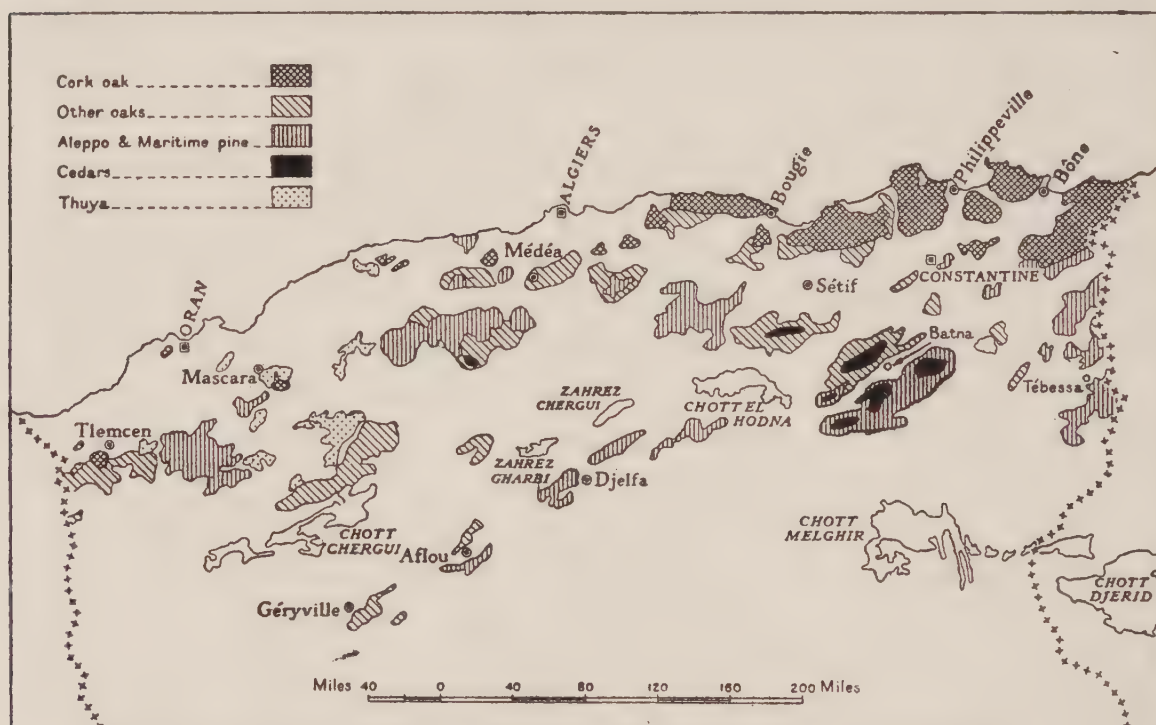


FIG. 60. *The distribution of forests*

a system of forest management designed to protect the forests and to build up a growing stock of usable timber. Since 1940, however, when imports from France were largely curtailed and other types of fuel were very scarce, Algerian forests have suffered, as readily available timber has been extensively cut down.

The best forests are in the coastal ranges, and the finest trees of this zone are the cork oak, Portuguese or zen oak, Afarès oak, holm oak, Aleppo pine, and maritime pine. Along valley bottoms are small quantities of such species as alder, willow, poplar, ash, elm, laurel, myrtle, walnut, mulberry, and olive: there are also some plantations of eucalyptus. The principal species of the interior plateaux and mountains are the Aleppo pine and holm oak, with smaller quantities of juniper, thuya, cedar, and scattered carob, pistachio, and acacia.

These forests serve chiefly to protect watersheds and to supply local needs of firewood and building materials. They are seldom in large continuous stands, but are mainly on higher ridges and steep slopes or in protected ravines. Under the heading of forest there are not only timber trees of some value, but also great stretches of maquis with a few scattered trees such as lentisk, dwarf palm, and pine. Much of the forest is woodland with a luxuriant undergrowth in the better watered regions, and there are few stands of trees such as are seen in central or eastern Europe. The location of the principal forests of economic value is given in Fig. 60.

It is estimated that there are 7,937,500 acres (3,175,000 hectares) of forest in Algeria, made up as follows:

	<i>Acres</i>
Aleppo pine.	1,712,500
Holm oak	1,647,500
Cork oak	1,112,500
Juniper	762,500
Thuya	315,000
Portuguese (zen) oak	250,000
Other oaks	250,000
Cedar	100,000
	<hr/>
	6,150,000

The 1,750,000 acres not accounted for are partly strips of mixed timber along streams, but mostly consists of brushwood and the scattered growth of trees such as the wild olive, carob, pistachio, and acacia.

Algeria produces about 420,000 tons of timber annually, of which 50,000 tons are for commercial use, 250,000 tons for logs, and 120,000 tons for charcoal: these figures include the annual output of about 150,000 railway sleepers. About 80 per cent. of Algeria's timber for constructional and industrial use, and the better hardwoods for cabinet work, have to be imported (Appendix C, Table II). The country supplies most of its own firewood, and exports a certain amount to neighbouring countries.

Cork Oak. Cork is the main commercial product of the Algerian forests and has been exported for more than a hundred years. The principal forests are in the east, in the Grande Kabylie, the Kabylie des Babors, and the Kabylie de Collo. There are also some stands in the Blida Atlas, the Dahra, the Sahel of Oran, the Mascara region, and the Monts de Tlemcen, but these are scattered. The area of these forests in each department is roughly as follows: Algiers 100,000 acres (40,000 hectares), Oran 20,000 acres (8,000 hectares), and Constantine

1,000,000 acres (400,000 hectares). Cork oak grows best on sandstone soils from sea-level up to altitudes of 3,300 feet and in favourable circumstances to 5,300 feet, and on sunny slopes facing south. The average height of the trees is from 30 to 40 feet, and, exceptionally, 60 or 70 feet: they are first stripped when twenty to twenty-five years old, after which the bark is removed every ten years (Vol. I, Photo. 49). The cork from the first stripping can be used only for making linoleum or as packing, but the cork from the second and subsequent strippings improves steadily in quality until the tree is from 100 to 120 years old. The chief cork forests are state property, and the product is sold by public auction. Owing to foreign import restrictions on manufactured cork, Algeria's cork exports are mostly in the crude state (Photo. 50). There are, however, about forty small factories in Algeria, the largest being at Algiers, Bougie, Djidjelli, Philippeville, and Bône, which produce annually between 3,000 and 4,000 tons of corks for bottles, for local and French consumption. Exports of crude cork were 41,858 tons in 1938.

Other Oaks. These include the holm oak, Portuguese (zen) oak, Afarès oak, and kermes oak. The kermes oak grows mainly below 2,000 feet, the holm oak and Portuguese oak from 2,000 to 5,000 feet, and the Afarès oak above 4,000 feet. They grow wherever there are 32 inches or more of rain, chiefly in the Grande and Petite Kabylie, and in scattered districts in the interior mainly between Tiaret, Teniet el Had, and Boghari. Portuguese oak, which grows to a height of 40 feet, is used for telegraph poles, pit-props, and planks for barrels. Timber for industrial use is also cut from Portuguese oak and Afarès oak: they are used too for railway sleepers and small products, such as frames, planks, and tool handles. The holm oak, which grows to 25 or 30 feet, and the kermes oak are used for pit-props, charcoal, and firewood: the natives use these woods for ploughs and other implements.

Tannin is obtained mainly from the bark of oak trees, especially cork oaks which are no longer of use for cork production, Portuguese oaks, and holm oaks; the cortex (outer covering) of the roots of the kermes oaks is also used. Experiments have also been made to extract tannin from various plants and bushes used by the natives, such as sumach, a gall from a type of tamarisk, retams, and rhus (*Arabic texera*). Exports amounted to 682 tons in 1936.

Aleppo Pine. Aleppo pines cover the largest forest areas in Algeria, and occur from the coast to the edge of the Sahara wherever the rainfall does not exceed 12 inches a year. They grow at any altitude

between sea-level and 6,600 feet or more: in the Tell the limit is usually 4,000 or 4,500 feet, but in the Saharan Atlas they grow at heights of between 6,400 and 7,200 feet. In the coastal areas the pine forests are widely distributed in the west, but do not form a continuous zone. There are very few east of Dellys and in the department of Constantine, where oak forests predominate. In the interior there are important continuous stands up to the boundary between the Tell and the steppes, in the inland ridges of the department of Oran, the Ouarsenis and Biban massifs, and in the Monts du Hodna. There are also forests in the Saharan Atlas, notably near Djelfa in the Monts des Ouled Nail, and in the Aurès. The wood is inferior to European pinewood, and so is used only for boxes, pit-props, lumber, paving blocks, small poles, and telegraph poles, and, after special treatment, for railway sleepers. There has been some attempt to exploit resin in the pine forests, notably near Sidi bel Abbès, Têlagh, Ammi Moussa, and Saïda, where the forests cover an area of 637,500 acres (254,800 hectares): fair results have been obtained. Exports of resin are small, averaging only 400 or 500 tons a year.

Other Trees. The maritime pine is found only to a limited extent in the coast region of the department of Constantine. It grows to a height of 50 feet and is used for boxes, pit-props, and telegraph poles. Cedars grow mainly at altitudes of 5,000 feet and up to 7,300 feet, principally in the Djurdjura and the Monts de Batna, though one of the finest reserves is near Teniet el Had (Vol. I, Photo. 46). They grow to a height of 150 feet, with a circumference of from 5 to 10 feet, and yield excellent timber for carpentry and cabinet work; the wood is also used for railway sleepers. Thuya, which is found in the Monts de Tlemcen, and in parts of Djebel Amour and the Monts des Ouled Nail, grows to a height of 40 feet, and is also used for carpentry and cabinet work. The roots of the wild briar, found abundantly in many parts, are used to make pipes. They are mostly finished in factories in the French Jura or the U.S.A., but there are several factories in Algeria, notably at Philippeville. Most of the roots come from the coastal forests of the department of Constantine, and exports amount to about 2,000 tons per annum. Juniper wood is used for constructional purposes and in the manufacture of tar. The date-palm is used in southern Algeria by the natives in many different ways, as explained on p. 218. Fibre is obtained from the leaves, which are also used for roofing huts, and the wood is used for building purposes, implements, and water-pipes.

Vegetable Fibre. Vegetable fibre is obtained by treating the leaves

of the dwarf palm (doum), which is found principally near the coast, in the uncultivated parts of the Tell, and more particularly in the Chélif plain. It does not grow above 3,300 feet, and flourishes on siliceous and limestone soils. The trees may attain a height of 20 to 30 feet, but as they are frequently cut by the natives they rarely grow so high: leaves and shoots form low on the trunk. The number of palms has diminished in recent years because the colonists, who were able to uproot the stumps too difficult to remove with native implements, have cropped the land on which they formerly grew. As a result the fibre workshops have moved several times: most of the factories are in the department of Oran, especially at Nemours, though the largest is at el Affroun (p. 259). The fibre is obtained from the leaves and is used to make ropes, bedding, carpets, and mats.

CHAPTER XIII

MINING, INDUSTRY, AND POWER

MINING

ALGERIA's wealth is essentially in her agriculture, not in her mineral resources: nevertheless, among France's overseas possessions the country ranks second to Morocco in mineral production. Before the French occupation there was almost no mining: only small quantities of lead and antimony were produced, the black, finely powdered sulphide of the latter mineral, known as *kohl* (*koheul*), being used by women for decorative purposes. Even after 1830 development was difficult and slow: transport was usually complicated and expensive, labour was hard to obtain, and prospecting in the interior was discouraged by the physical difficulties of the country and the opposition of the native population. Railway construction helped to solve the problem of transport, though as deposits are generally widely scattered (especially in the case of lead and zinc), many mines are inevitably at a great distance from any line. Thus the first expectations of mineral wealth have scarcely been fulfilled, and in normal years minerals account for only about one-tenth of the total value of the country's exports. Production of individual ores varies somewhat from year to year, according to the world price and other changing circumstances.

Mining is much more important in the east than in the west, there being 98 mines in the department of Constantine (53 undeveloped), 27 in Algiers (13 undeveloped), and only 10 in Oran (5 undeveloped), whilst 10 of Algeria's 19 open mines are also in Constantine. Iron ore is the mineral most worked, and in pre-war years the United Kingdom was the principal purchaser. Phosphates are also mined on a large scale, and the ore deposits of lead and zinc are of some importance. Antimony ore, mercury ore, pyrites, and diatomaceous earth (*kieselguhr*) are also produced for export. Nearly all the exports are made in a crude state, and it seems unlikely that a refining industry will develop owing to the poverty of Algeria's power resources. Both coal and petroleum have to be imported, and the generation of hydro-electricity is made difficult and unreliable by the prolonged dry season.

The table below gives the available production figures for the years 1936-1939, with certain particulars of the export trade for the

years 1937-1938. In this table, and throughout the volume, all tons are metric tons.

The approximate location of many of the places mentioned in this chapter is given in Figs. 62 and 63.

Production and Export of Minerals, 1936-1939
(Tons unless otherwise stated)

Mineral	Production				Export	
	1936	1937	1938	1939	1937	1938
Iron ore	1,884,250	2,371,650	3,060,770	2,750,000 ¹	2,556,410	2,754,614
Metal content	1,010,000	1,260,000	1,640,000	1,500,000 ¹	..	..
Zinc ore	5,865	17,740	15,400	4,510 ²	17,668	8,830
Metal content	3,150	7,860	6,970	..	..	..
Lead ore	4,230	7,960	7,725	3,865 ²	7,985	8,880
Metal content	2,750	4,480	4,400	..	..	..
Iron pyrites	19,970	38,760	44,150	25,450 ²	4,400	8,870
Sulphur content	9,180	17,055	19,430	..	..	..
Copper content	200	390	440	..	..	..
Copper ore ³	200	..	15	78 ²	..	..
Antimony ore	2,600	2,160	2,066	1,081 ²	2,300	1,945
Metal content	1,397	973	1,026	..	..	..
Cinnabar . . . . .	..	2,640	3,120	..	..	..
Mercury content	4	5	7	3 ²	10	13
Manganese ore . . . . .	..	..	..	..	6,822 ⁴	..
Silver (fine oz.)	65,545	72,177	90,000	85,000 ¹	..	..
Phosphate (rock)	531,000	631,200	583,720	297,740 ²	572,308	485,579
Phosphate (ground)	2,770	5,515	7,710	..	..	..
Superphosphate	41,000	73,000	80,000	..	23,543	19,100
Coal	6,900	14,200	15,400	8,720 ²	..	..
Petroleum	295	279	259	132 ²	..	..
Diatomaceous earth	12,120	12,960	15,100	..	14,107	15,400
Barytes . . . . .	..	2,137	3,069	..	1,373	3,031
Fuller's earth . . . . .	..	..	3,000	..	..	..
Salt (controlled production)	62,400	63,130	74,630	..	41,409	42,930
Gypsum	45,265	46,125	33,325	..	229	354

¹ Estimated production.

² First six months of 1939 only.

³ Other than iron pyrites.

⁴ Re-exports from French Morocco.

The distribution of labour in the various mining industries is given in the following table:

Labour employed in the Principal Mines
(Annual average)

Mines of	1936	1937	1938
Iron ore	3,760	5,950	9,430
Phosphate	1,645	2,040	1,877
Lead and zinc ore	915	1,555	2,097
Coal	200	240	286
Iron pyrites	85	160	296
Antimony ore	35	40	234
Mercury ore	30	45	119
Petroleum	16	16	17
TOTAL	6,686	10,046	14,356

Iron Ore

Algeria normally ranks as the eighth or ninth producer of iron ore in the world, its output of 2,371,650 tons in 1937 and 3,060,770 tons in 1938 representing rather more than $1\frac{1}{4}$ per cent. of the world total. Ore has been mined on a considerable scale since the workings at Ain Mokra (near Bône) and Beni Saf were opened up by the C^{ie} Mokta el Hadid in 1865 and 1867 respectively, and a total of more than 60 million tons has been exported. To-day the main producing areas are along the eastern frontier of the country. The order of production for 1929, the last year before the economic depression, was as follows:

Djebel Ouenza	.	.	.	.	882,337 tons
Beni Saf group	.	.	.	.	540,781 „
Zaccar	.	.	.	.	172,800 „
Rouina	.	.	.	.	146,282 „

Five other mines produced more than 40,000 tons of ore in 1929: they were Timezrit (49,737 tons), Tadergount near Bougie (47,500 tons), Chabet Ballout (45,125 tons), Beni Aquil-Breira (41,551 tons), and Beni Felkai near Tadergount (40,058 tons). The total output was 2,200,000 tons, a figure slightly less than that of 1937 and considerably below that of 1938. Since 1929 the main changes have resulted from the development of Djebel bou Kadra on the Tunisian frontier and from the increased output of the Timezrit mine. The fluctuations in production from 1900 to 1938 are shown in Fig. 61. The reserves were estimated in 1934 at about 160 million tons.

Geologically considered, the Algerian iron ores belong to several distinct types of deposit. All the more important ore-bodies are haematite and limonite masses, partly derived by oxidation from siderite (iron carbonate), which form replacements in limestones dominantly of Aptian (Lower Cretaceous) age in the east and of Liassic age in the west. Vein and contact deposits of haematite with pyrites and magnetite have been exploited on a small scale in the past, but are now of relatively little value. Various unworked sedimentary ores, principally of oolitic character, are also known, but are of doubtful economic value. The haematites are very low in phosphorus, sulphur, and silica, and carry an iron content of 48 to 60 per cent. A few deposits contain a little manganese, which exceptionally reaches 8 per cent. In general, the size-grading of the marketed ore is good, though some mines in the departments of Algiers and Oran produce an unsatisfactorily large proportion of fine material.

No smelting industry has developed in Algeria because of the shortage of coal in the country, and almost all the ore produced is exported, largely as a return cargo for coal. In normal circumstances the United Kingdom is the main purchaser of Algerian ore, which is particularly suited to the needs of British blast furnaces. In 1937 the United Kingdom took 55 per cent., and Germany 30 per cent.,

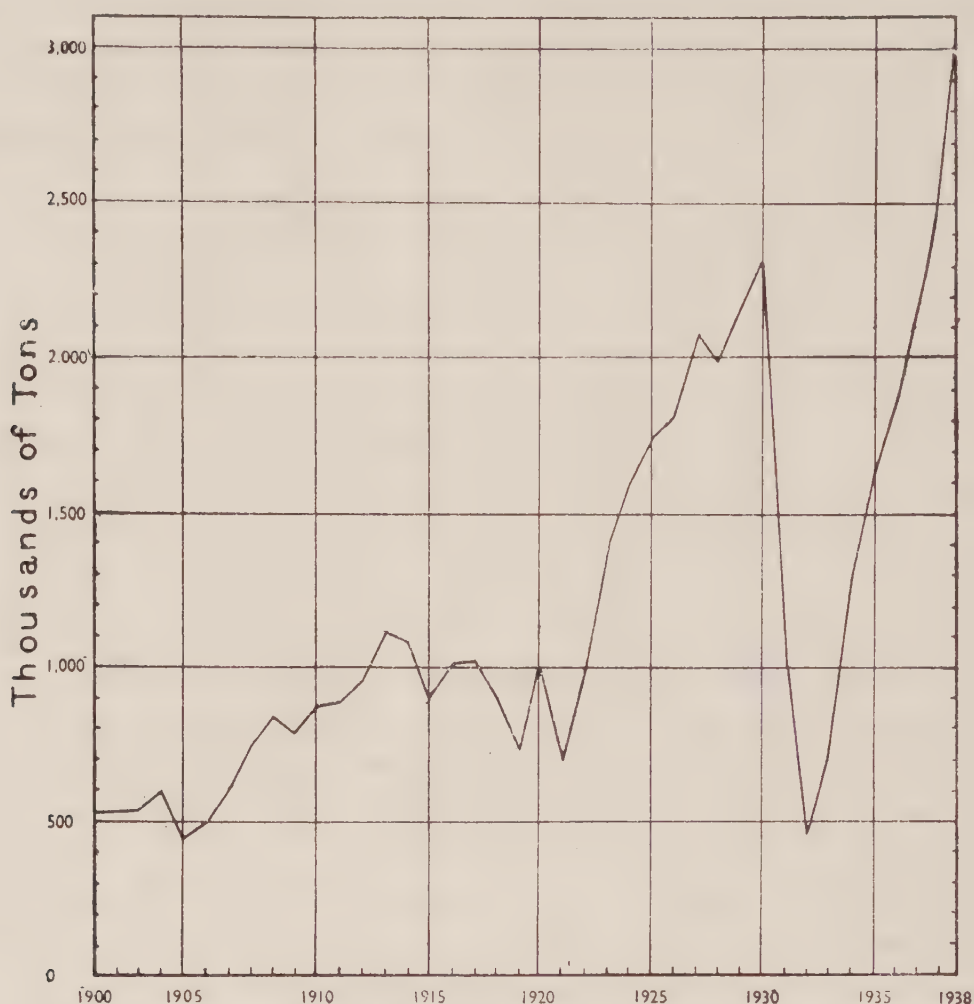


FIG. 61. *The production of iron ore, 1900-1938*

of the 2,556,410 tons of ore exported from Algeria: France, in contrast, took only 106,000 tons (about 4%). Of the 5,156,000 tons of iron ore imported by the United Kingdom in 1938, Algeria provided 1,348,250 tons (valued at £1,785,707), Tunisia 461,360 tons, and the Spanish Zone of Morocco 159,900 tons. Thus of the total British imports one-third came from north Africa, Algeria taking the leading place and Tunisia the fifth place after Sweden, Spain, and Norway.

The various producing areas are shown in Fig. 62, and may be considered in groups from east to west as follows:

The Beni Saf District. Mining has been carried on around Beni Saf since 1867 by the C^{ie} Mokta el Hadid, which in 1878 absorbed the C^{ie} de Mines de Soumah et Tafna. The port of Beni Saf was constructed by this company between 1876 and 1881 (p. 121). From 1867 to 1932 nearly 19 million tons of iron ore were obtained: in recent years the average annual production has been between 300,000 and 400,000 tons. The chief producers, in the order of their output since they were first opened, are the Baroud-Bou Hamedi-Sidi Brahim group, Camerata, Dar Rih, Melkimen, Zenzella, Boukourdan, and the three mines of the Sidi es Safi concession (Hamri I, Hamri II, Hamar-Keloucha). All these mines are linked with Beni Saf by light railways. Other important mines in western Algeria are at Ghar el Maden (Bab M'Teurba), 15 miles north-west of Montagnac, and Sebabna, near the Moroccan frontier. Ghar el Maden produced over 800,000 tons of manganiferous ore (2 to 7% manganese) during the period 1898-1932, but there has been little production since. It is linked to the roadstead off Mersa Honain on the east side of Cap Noé by a cableway about $4\frac{1}{2}$ miles long, with a capacity of 15 tons per hour (p. 121). Sebabna, with a total output from 1913 to 1938 of about 700,000 tons of manganese-bearing haematite, has a cableway about 4 miles long to Port Kelah on the east side of Pointe bou Madane, where ore can be loaded at the rate of 900 tons per hour (p. 118, Photo. 51). Formerly the ore was exported through the now disused harbour at Port Say (p. 117). The open-cast mine near Djebel Krichtel (north-west of St. Cloud, near Oran) was worked only between 1905 and 1914, during which period it produced 550,000 tons of haematite.

The Chélif Valley. The chief mine of the Chélif valley is at Rouina, 30 miles east of Orléansville. It is joined to the Oran-Algiers railway by 3 miles of electrified railway line (0.60-metre gauge). The workings are open cast and have produced more than 2 million tons of ore since they were opened in 1872. This mine, with others at Bou Rached and Kef Nsour (near Duperré), was formerly worked by the Société des Mines de fer de Rouina, a company which was liquidated in 1937. Since then Rouina has been exploited by the Société minière de Miliana, which also controls the working of Beni Aquil-Breira (p. 239) and of the Filfila group of mines (p. 240). In recent years the company's production has been 64,200 tons (1937) and 84,290 tons (1938). Another mine in the Chélif valley, at Témoulga, was closed in 1914, after producing 261,000 tons in 10 years.

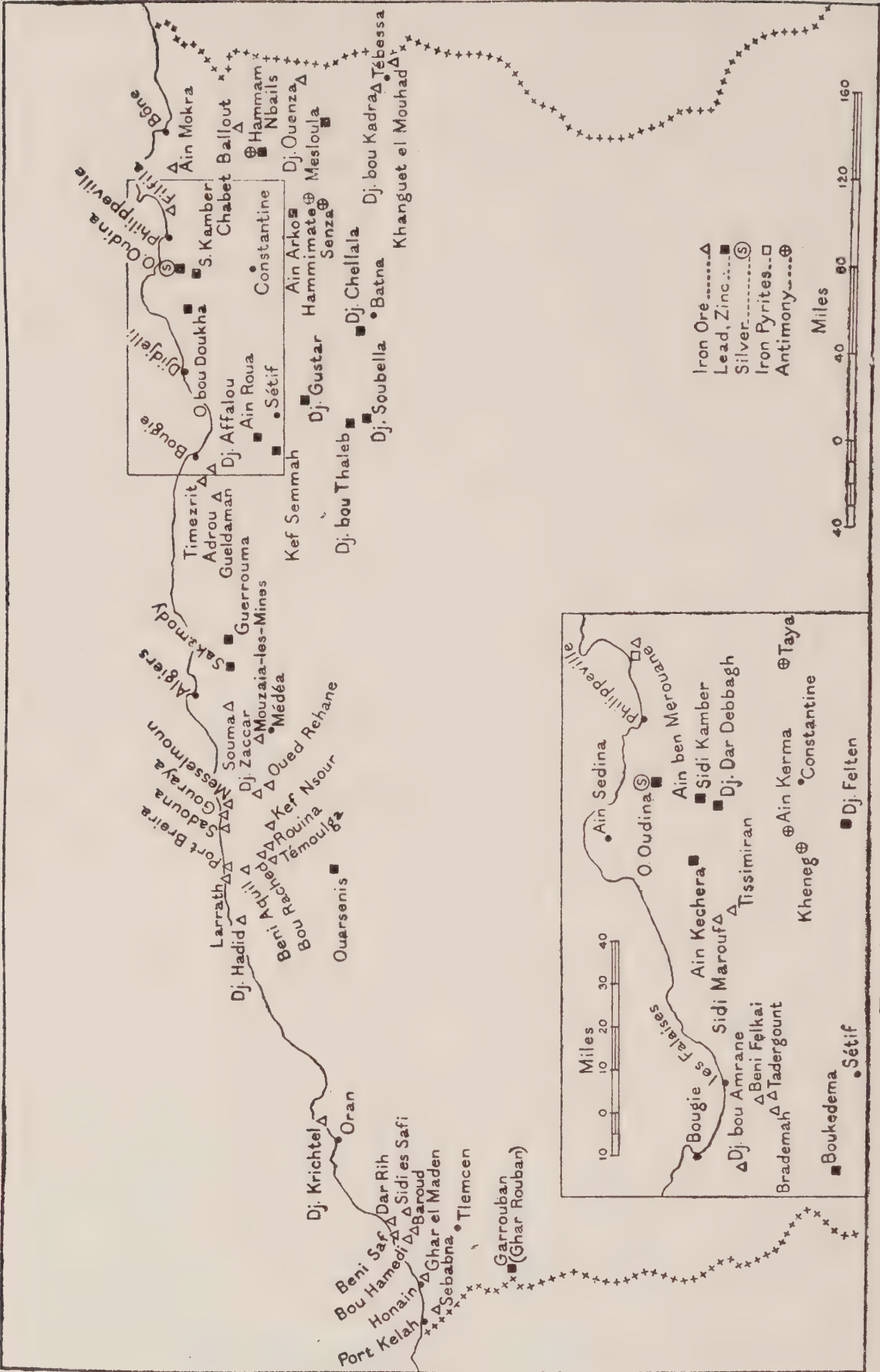


FIG. 62. The location of principal mines and quarries, I

Djebel Zaccar. This mine, the third largest producer in the country, has been worked since 1903 by the Société des Mines de Zaccar. The output averages 250,000 tons per annum and exceeds $5\frac{1}{2}$ million tons in aggregate. The mine is 62 miles south-west of Algiers, from which port the ore is exported: it is linked to the Oran-Algiers railway by a mineral line 6 miles long (0·75-metre gauge). The neighbouring mine of Oued Rehane produced a more siliceous ore, which was sent to Affreville by means of a 3-mile long cableway, with a capacity of 25–30 tons per hour. About 450,000 tons were exported between 1921 and 1932, since when there has been little or no production.

The Dahra. There are six concessions in the Dahra, mainly between Ténès and Cherchel: from west to east they are Djebel Hadid, Beni Aquil and Breira, Larrath, Sadouna, Gouraya, and Messelmoun. Of these only Beni Aquil–Breira and Gouraya have produced ore since the War of 1914–1918. The former deposits, now worked by the Société minière de Miliana, are the more productive; they have yielded more than $1\frac{1}{4}$ million tons of haematite since 1911. There is a 6-mile long cableway, which can take 30 tons of ore per hour, to Port Breira, where an electric transporter for loading ore, with a capacity of 650 tons per hour, is situated. At present the port is disused (p. 146). Gouraya is on the coast on the western side of Ras Taska.

East of the Dahra, in the Blida Atlas, iron ore was formerly mined at Mouzaia-les-Mines (south-east of Blida) and Souma (south of Boufarik).

The Kabylie des Babors. The principal deposit is at Timezrit (23 miles west of Bougie), which is linked to the Beni Mansour-Bougie line at el Maten by a cable, 2 miles long, with a capacity of 30 tons per hour. The mine has produced over $2\frac{1}{4}$ million tons of haematite with an iron content of about 58 per cent., and is the fifth largest producer in the country. Production advanced from 49,737 tons in 1929 to 123,250 tons in 1937 and 116,000 tons in 1938. The neighbouring mine at Beni Himmel produced 280,000 tons between 1913 and 1928, but there has since been little production. There is a small mine farther south at Adrou Gueldaman, on the right bank of the Oued Soummam, connected by an overhead cable, $1\frac{1}{2}$ miles long, to the Akbou railway station. There are two other mines in the Bougie district, at Djebel Affalou, 16 miles south-west of the port, and Djebel bou Amrane, 11 miles to the south-east. The former closed in 1928 after producing 245,000 tons of haematite, mostly by

open working. The latter has been developed only since 1923 by the C^{ie} des Hauts Fourneaux de Chasse, and has extensive reserves. It is connected across very difficult country to Bougie by a cableway, 11 miles long, with a capacity of about 30 tons per hour. Production in 1938 was 103,940 tons.

Iron ore was mined at Beni Felkai, $7\frac{1}{2}$ miles south of the estuary of the Oued Agrioun, until 1930, when the mines were closed after producing $1\frac{1}{4}$ million tons since 1913. Most of the workings are open quarries and are linked with the coast at les Falaises by 11 miles of narrow-gauge (0.70-metre) line (p. 172, Photo. 52). Since 1928 the neighbouring mines of Tadergount and Brademah have been joined to this line by cableways. Production from these three undertakings began again in 1937 under the Société minière de la Kabylie. In that year 36,600 tons were produced and in 1938 104,500 tons. The output from Tadergount now exceeds that of the Beni Felkai mines.

Farther east there are deposits at Sidi Marouf and Tissimiran, on the western and eastern sides of the Oued el Kebir, about 6 miles south of el Milia. The output from these two deposits was 61,090 tons in 1938. To the south of the Kabylie des Babors there is a concession owned by the Société des Mines du Guergour, as yet unworked, at Djebel Anini.

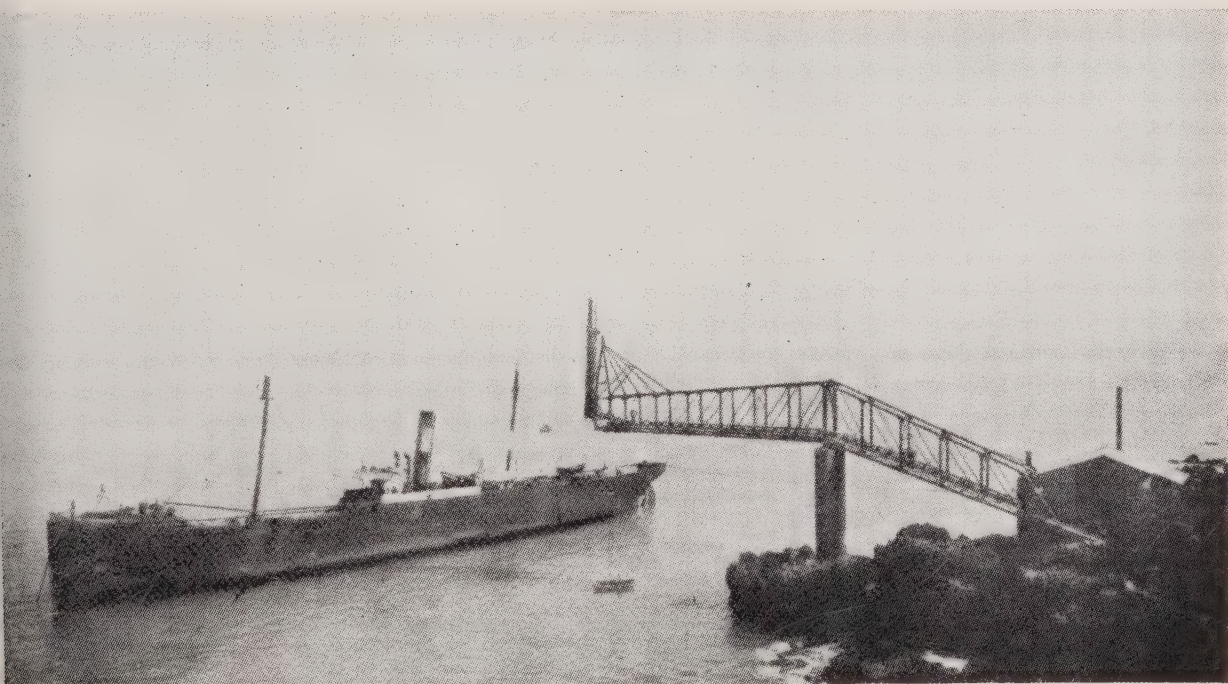
The Massif du Filfila. The three concessions of the Massif du Filfila—Filfila, Fendeck, and Ain ben Merouane—lie about 11 miles due east of the port of Philippeville, to which they are linked by an overhead cableway along the coast. Filfila and Fendeck produce specular iron ore with a metal content of about 66 per cent., together with a small quantity of pyrites. Ain ben Merouane produces massive haematite and pyrites, especially the latter: it has been in operation continuously since it was opened by the Société des Mines de fer de Rouina in 1918, and was one of the few mines in Algeria to continue in full production during the depression of the early 'thirties. Since 1937 the controlling company has been the Société minière de Miliana.

The Ain Mokra mine, now exhausted, was first opened by the C^{ie} Mokta el Hadid in 1867 and in 40 years produced nearly 7 million tons of ore, largely for export to Britain. The mine was finally closed in 1914.

The Tunisian Frontier Region. This region accounts for more than three-quarters of the total Algerian output and the reserves are estimated to exceed 50 million tons of ore. The area of greatest impor-



51. *Loading iron-ore, Port Kelah*



52. *Iron-ore transporter, les Falaises*



53. *Ouarsenis zinc mine*



54. *Kef Semmah zinc mine, west of Sétif*

tance lies immediately north of Tébessa, though Chabet Ballout, the seventh producer in Algeria in 1929, is farther north, about $2\frac{1}{2}$ miles from Khedara station, between Souk Ahras and Ghardimaou (Tunisia). The Djebel Ouenza and Djebel bou Kadra deposits are both worked by the Société de l'Ouenza, which was granted the concession in 1913. Production from Ouenza did not begin until 1921, with the completion of the replacement of the narrow-gauge railway from Souk Ahras to Tébessa by a normal-gauge line as far as Oued Kébérit (35 miles from Souk Ahras and 101 miles from Bône), and the building of a line, 16 miles long, from the mine to Oued Kébérit. These lines, and their continuation from Souk Ahras to Duvivier and Bône, have subsequently been electrified, power being supplied from the generating station in Bône owned by the C^{ie} du Bourbonnais (p. 274). Special loading facilities have been installed in the port of Bône. The production of the Société de l'Ouenza rose steadily between 1921 and 1930, when there was a peak figure of 1,040,000 tons, and, as shown in the following table, has increased again since the economic depression, the figure for 1938 being 1,864,250 tons.

1921	.	.	11,157 tons	1930	.	.	1,040,000 tons
1922	.	.	225,253 "	1931	.	.	321,200 "
1923	.	.	417,917 "	1932	.	.	206,900 "
1924	.	.	595,656 "	1933	.	.	362,200 "
1925	.	.	639,905 "	1934	.	.	748,200 "
1926	.	.	506,970 "	1935	.	.	975,300 "
1927	.	.	765,611 "	1936	.	.	1,111,872 "
1928	.	.	750,053 "	1937	.	.	1,358,600 "
1929	.	.	882,337 "	1938	.	.	1,864,250 "

Djebel bou Kadra lies about 20 miles south of the Ouenza mines and 7 miles north-east of Morsott on the Oued Kébérit-Tébessa narrow-gauge line. The area was granted as a *minière dominiale* to the Société de l'Ouenza by a convention of 29 August 1925, and working began with the completion of an 11-mile normal-gauge railway to Ain Chenia on the Oued Kébérit-Ouenza branch.

Between 1903 and 1929 the C^{ie} Mokta el Hadid worked an ore deposit at Khanguet el Mouhad about 10 miles east of Tébessa, but the mine is now closed.

Lead and Zinc

In Algeria, as elsewhere, ores of lead and zinc generally occur together and both minerals are often worked in association. In only a few mines is one or the other metal exclusively worked, but

throughout the country, as a whole, and unlike Tunisia, zinc is more common than lead. Most of the mines are in the department of Constantine, though there are some in the department of Algiers and a few in the department of Oran near the Moroccan frontier, representing a continuation of the lead and zinc deposits of French Morocco. Many are in mountain districts where they are difficult of access. Development has been further hampered by mining laws which are more suited to large-scale workings than to the small, isolated mines typical of most parts of Algeria. The economic depression of the early thirties led to many mines being closed, and whereas in 1929 there were twenty-five major productive lead-zinc mines, with an output valued at about 32 million francs, in 1933 only three were producing ore. The output of concentrates fell during this period from 14,200 tons of lead and 32,600 tons of zinc in 1929 to 160 tons of lead and 5,100 tons of zinc in 1933, but recovered to 7,960 tons of lead and 17,740 tons of zinc in 1937. The zinc is mainly sent to Belgium for refining, as was the lead until July 1935, when the lead mines were subsidized by the French Government on condition that more concentrates were sent to France and French possessions. Two-fifths still went to Belgium, however, up to the outbreak of war.

Between 1870 and 1938 the total production of concentrates amounted to 1,913,000 tons of zinc (86% calcined 'calamine', 14% blende) and 465,000 tons of lead (galena). The reserves are estimated at about $1\frac{1}{2}$ million tons.

The common zinc ores in Algeria are smithsonite (the carbonate), hemimorphite (the silicate), and blende (the sulphide): it should be noted that in mine reports the name 'calamine', strictly synonymous with hemimorphite, is used loosely for the silicate, the carbonate, or a mixture of both. One of the chief and most constant producing centres is the Ouarsenis mine in the Ouarsenis mountains, between Orléansville and Tiaret, owned by the Société de la vieille Montagne (Photo. 53). Here operations began in 1891 and produced 251,000 tons of calcined ore to 1938, in which year the output was 6,345 tons. Also in the department of Algiers are the blende mines of Sakamody and Guerrouma, both in the Blida Atlas, which in their peak year (about 1910) had an output of over 12,000 tons. They closed during the depression, but the latter mine produced 140 tons in 1938. There are several zinc-mining groups in the department of Constantine: they include the mines of the Société des Mines du Guergour at Kef Semmah or Guergour (with Boukedema and Ain

Roua), to the west of Sétif (3,160 tons in 1938) (Photo. 54); Djebel bou Thaleb (Bou Iche and Soubella), 62 miles south of Bougie (695 tons in 1937); Djebel Gustar, south-east of Sétif (3,085 tons in 1938); Djebel Chellala, near Batna (2,460 tons in 1937); Djebel Felten, south-west of Constantine, above the upper valley of the Oued Rummel; Sidi Kamber (305 tons in 1937) and Oued bou Doukha with Ain Kechera (1,085 tons in 1938); Oued Oudina, 5 miles south-west of Philippeville (1,460 tons in 1937); Ain Arko, north-west of Ain Beida; Hammam Nbails, south-east of Guelma; and Mesloula, east of Ain Beida. The mines at Hammam Nbails are now almost exhausted, but since they were first opened in 1871 they have produced more than 300,000 tons of calcined smithsonite (together with 45,000 tons of antimony ore), a total exceeding that of any other zinc mine in north Africa.

Lead, usually in the form of galena, was one of the few minerals worked in Algeria before the French occupation, though it is now commercially less important than zinc. Many of the mines which closed during the years of depression have not yet reopened. The chief workings are at Mesloula, near Clairefontaine, to the east of Ain Beida, and for many years these provided about half the country's total output. Production in 1938 was 3,750 tons. There are important deposits in the Kabylie de Collo, especially at Sidi Kamber and Djebel Dar Debbagh (785 tons in 1938) and in the valley of the Oued Oudina, 5 miles south-west of Philippeville (620 tons in 1938). Small amounts of lead are obtained from many of the zinc mines noted above, especially Guerrouma, Soubella, Djebel Felten, Oued bou Doukha, and Ain Kechera. The silver-bearing galena in the Monts de Tlemcen at Garrouban (Ghar Rouban) was first worked by the Romans, though its modern exploitation dates only from 1851. The output in 1938 was 1,315 tons. Concentrates from all these mines are sent to France or Tunisia for smelting.

Iron Pyrites

Iron pyrites (sulphide of iron) is a principal source of sulphur for the manufacture of sulphuric acid, which is essential to the Algerian superphosphate industry (p. 262). Small occurrences of pyrites ore are frequent in the country, and several have been exploited, but the only mass now producing is the relatively large deposit of Ain ben Merouane, about 12 miles east of Philippeville, worked by the Société minière de Miliana. Production has totalled over 200,000 tons since mining began, and the reserves are estimated at about

800,000 tons. Part of the pyrites is cupriferous, with up to 2·5 per cent. copper. Output has increased in recent years from 19,970 tons in 1936 to 44,150 tons in 1938, giving in the latter year 19,430 tons of sulphur and 440 tons of copper. Iron ore (haematite) is produced from the same mine (p. 240).

Copper

There are numerous occurrences of copper ore associated with the lead and zinc minerals, but the deposits are of no great extent, and production, which dates from 1846, has never been large. The bulk of the copper now exported is a by-product of the pyrites workings. The main deposits, in the form of small veins and irregular replacements of copper minerals (chalcopyrite, tetrahedrite, malachite, and azurite) in limestone, are in the northern part of the department of Constantine at Tadergount and Boudjoudoun (between Bougie and el Milia), Ain Barbar (in Djebel Edough, west of Bône), and Oum Teboul, near the Tunisian boundary. From 1920 to 1930, 81,800 tons of concentrate were produced, with a copper content of 4,161 tons. The copper carbonate (malachite and azurite) deposits at Ain Sefra gave 200 tons of 8 per cent. ore in 1937.

Antimony

Algeria is responsible for the production of about $2\frac{1}{2}$ per cent. of the world production of antimony, which is the basis of type-metal and other important alloys. Deposits are closely associated with the lead, zinc, copper, and mercury minerals. Among the ores exploited the most frequent are the oxides, senarmontite, valentinite, and cervantite; the sulphide stibnite is less common. The mines are in the department of Constantine, especially at Hammimate and Senza, 45 miles south-east of Constantine (which produced 97 tons of senarmontite and valentinite in 1937), Taya west of Guelma (92 tons of stibnite in 1937), and Kheneg and Ain Kerma, north-west of Constantine (2,014 tons, principally cervantite, in 1938). The Hammam Nbails zinc mine produced 43,000 tons of antimony ore (flajolotite, an antimoniate of iron) during the War of 1914-1918.

Mercury

Cinnabar (mercuric sulphide) has been mined at Ras el Ma, near Jemmapes, 15 miles south-east of Philippeville, since 1861. The mine was re-equipped in 1939. Production from 1924 to 1932 totalled about 3,200 flasks (110 tons). The mineral has also been

worked, with galena, at the Taghit mine in the Aurès mountains, which produced 15 tons of quicksilver per annum from 1902 to 1908. The total production in 1938 was 191 flasks (6·6 tons), of which nearly half came from a hitherto unrecorded mine named Koudiat Stah in the Kabylie des Babors between Djemila and Fedj Mzala.

Manganese

The iron ores of Algeria contain a variable proportion of manganese (p. 235), which is abnormally high (25 per cent.) in the haematite deposits of Ain Djeraoua in the department of Oran. In 1928, 2,500 tons were exported, but production has been negligible in recent years. The figures given on p. 234 refer to re-exports from French Morocco.

Silver

The output of silver forms a by-product of the lead mines, especially those in the Kabylie de Collo, in the valley of the Oued Oudina. Production, which fluctuates considerably from year to year, was 72,000 fine ounces in 1937 and 90,000 fine ounces in 1938.

Phosphate Rock

The Eocene and Upper Cretaceous limestones of north Africa contain one of the greatest belts of phosphate rock in the world, stretching along the shores of the southern Mediterranean from Morocco to Syria. In Algeria the phosphates are of Eocene age and occur in two zones: the northern extends from Sidi bel Abbès in the west through the Chélif valley, the Kabylie des Babors, and the Biban chain, to the high plains of Sétif and the Guelma region in the east; the southern belt ranges from the Aurès and Zab mountains to Tébessa on the Tunisian frontier. Throughout these zones the constitution of the phosphate rock is variable, and the mineral can only be worked economically when the phosphate content exceeds 58 per cent.: consequently the number of deposits exploited is small. Nevertheless, Algeria, with an annual output exceeding half a million tons (5% of the world production), is the sixth world producer after the U.S.A., the U.S.S.R., Tunisia, French Morocco, and the Pacific island group of Nauru and Ocean island.

Production in Algeria dates from 1886—rather earlier than in Tunisia—and by 1895 the main deposits had been opened up and connected with the coast. Working is confined to two principal districts: the Tébessa region, which accounts for over 90 per cent. of the total and is a continuation of one of the principal Tunisian

deposits (notably Kalaa Djerda); and the Sétif region. Production figures for the two areas are given below (p. 248).

In the Tébessa area Djebel Kouif, 15½ miles north-east of Tébessa, is the main producer. The deposits were discovered in 1892 and worked by a British company from 1893 to 1911, when they were taken over by the Société des Phosphates de Constantine. It had an output of about 750,000 tons a year until 1930, and since

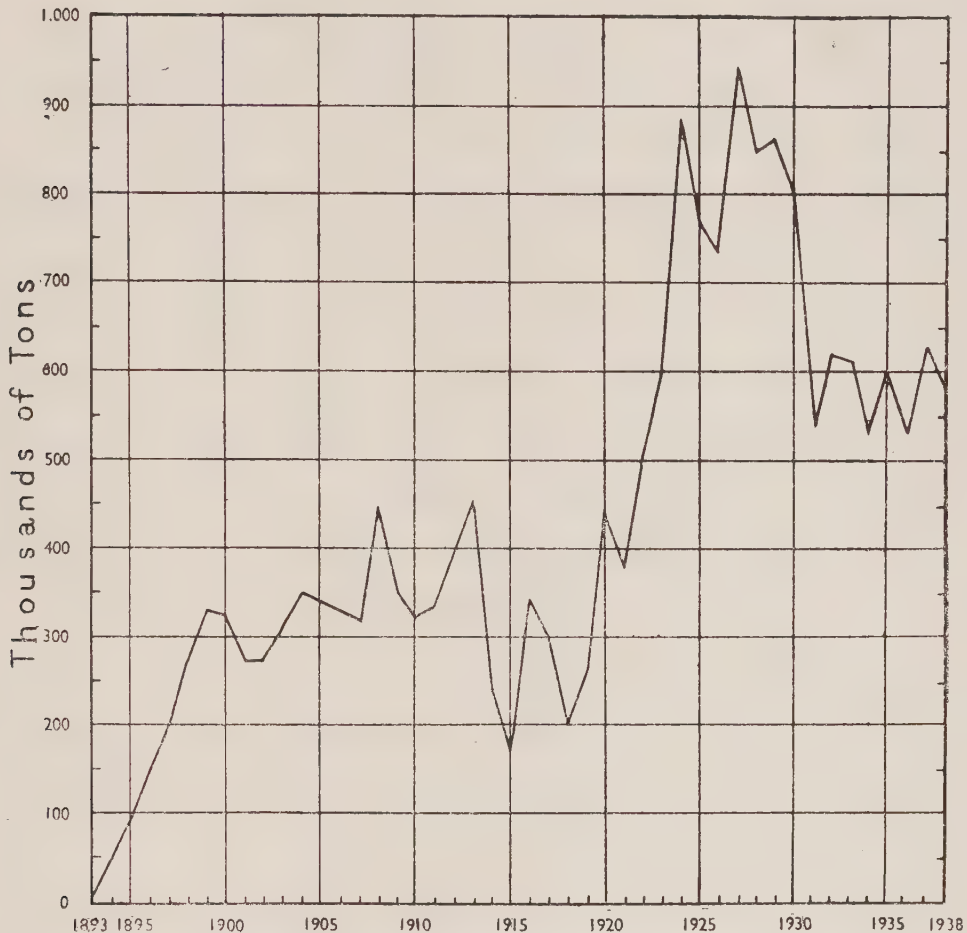


FIG. 64. *The production of phosphates, 1893-1938*

the economic depression it has again produced on a large scale, with an average output of about half a million tons per annum. There are five phosphatic beds, three of which are exploited, the phosphate content averaging about 65 per cent. To the end of 1934 more than 14 million tons had been extracted; the reserves are estimated to exceed 17 million tons. The equipment of the mines is of the most modern type, and modern loading machinery has been installed at Oued Kéberit and at Bône, the port of export (p. 189). The railway is narrow gauge as far as Oued Kéberit (59 miles), where it joins the normal-gauge and electrified line from Djebel Ouenza to Bône (160 miles from Kouif). Other deposits in the Monts de Tébessa

are at Djebel ed Dir, which was worked between 1893 and 1908 and produced over 1 million tons; and nearby at Ain Kissa and Ain Diba, which to 1912 furnished 648,000 tons. About 50 miles south of Tébessa are the high-grade (62%) deposits of Djebel Onk, which were discovered in 1906 and leased in 1931 to a company formed of the main phosphate producers in Algeria and Tunisia, but have not so far been worked. The Bled el Habda deposits lie 11 miles farther to the south-east.

On the high plains of Sétif, between and to the south of Sétif and Bordj bou Arréridj, deposits have been worked at Mzaita, Tocqueville, and Bordj Redir. Mzaita is still producing and has an annual output of 40,000–60,000 tons: it has yielded over 1 million tons since it was opened in 1913. The deposits are about 8 miles from the station of Ain Tassera, which is 112 miles by rail from Bougie. Production at Tocqueville, 5 miles east of Mzaita, has fluctuated considerably: when the mine was closed in 1928 it had produced over 700,000 tons. Bordj Redir, which also closed in 1928, had produced 669,000 tons since 1906. The mine was linked by a 10-mile cableway to the railway at Galbois (south-east of Bordj bou Arréridj). To the south-west of these deposits there are great reserves of phosphates, estimated to exceed 20 million tons, in Djebel Maadid, but no concession has as yet been granted in this area.

Algeria's total production to the end of 1933 was 17,200,000 tons, of which 12,800,000 tons came from Djebel Kouif, 1,100,000 tons from Djebel ed Dir, and 2,700,000 from the Sétif district. The fluctuations in production since 1893 are shown in Fig. 64. The output since 1934 has been as follows:

		<i>Total</i>	<i>Soc. des Phosphates de Constantine (Kouif)</i>	<i>Cie du Mzaita (Mzaita)</i>
1934	. .	532,200 tons	460,900 tons	71,300 tons
1935	. .	603,900 „	553,200 „	50,700 „
1936	. .	531,000 „	488,300 „	42,700 „
1937	. .	631,200 „	566,700 „	64,500 „
1938	. .	583,720 „	539,470 „	44,250 „

The labour employed at the phosphate mines averages 2,000 persons (1,877 in 1938), 85 per cent. of whom are natives of the country. Of the Europeans some of the lower-grade workers are Italian, but most are French.

The bulk of the output is exported as crude phosphate rock, though there are small factories manufacturing superphosphate at la Sénia near Oran, Maison Carrée (Algiers), and Bône (p. 262). The production of these factories varies considerably; it was about

80,000 tons in 1938; some is exported, especially to Egypt. The exports of phosphate rock, amounting to 572,308 tons in 1937 and 485,579 tons in 1938, went in part to France (36% in 1937) and in part to Germany (26%). The United Kingdom imported from Algeria 37,482 tons (valued at £58,787) in 1937 and 40,431 tons (£64,687) in 1938.

The phosphate deposits of Algeria are poorer in quality and less easily worked than those of Morocco and Tunisia, with which they have to compete in the world market; but after a crisis in the industry in 1930 the two Algerian companies, the Société des Phosphates de Constantine and the C^{ie} minière de Mzaita, formed a sales organization with the Moroccan producers. This was followed on 1 February 1934 by an agreement between this cartel and the Phosphate Export Association of the U.S.A., to last until 31 December 1943, and intended to stabilize world prices and regulate the market. In the years immediately before the outbreak of the present war the French Government gave every encouragement to producers of phosphate in north Africa in order to increase the stocks available to France in the event of war: the stock in Algeria on 31 December 1938 was 202,900 tons.

Coal

Algeria is deficient in domestic supplies of fuel, and only one small coalfield is worked at present, that of Kenadza, about 20 miles west of Colomb Béchar (Photo. 55). Thin unexploited coal-seams, of little value, also occur near Oran (in Djebel Kahar, and between Cap Lindlès and Cap Falcon), near Port Gueydon, and elsewhere; and there are lignite deposits of Tertiary age at Rouached (west of Mila in the Kabylie des Babors), Bled Boufour (in the Dahra between Ténès and Orléansville), Marceau (near Cherchel), and Condé Smendou (near Constantine). The Marceau deposits produced 5,000 tons between 1898 and 1918, and those at Smendou about 4,000 tons during the War of 1914–1918, but neither has been mined commercially since 1921. Small quantities are still produced for local use in lime-kilns and steam-tractors.

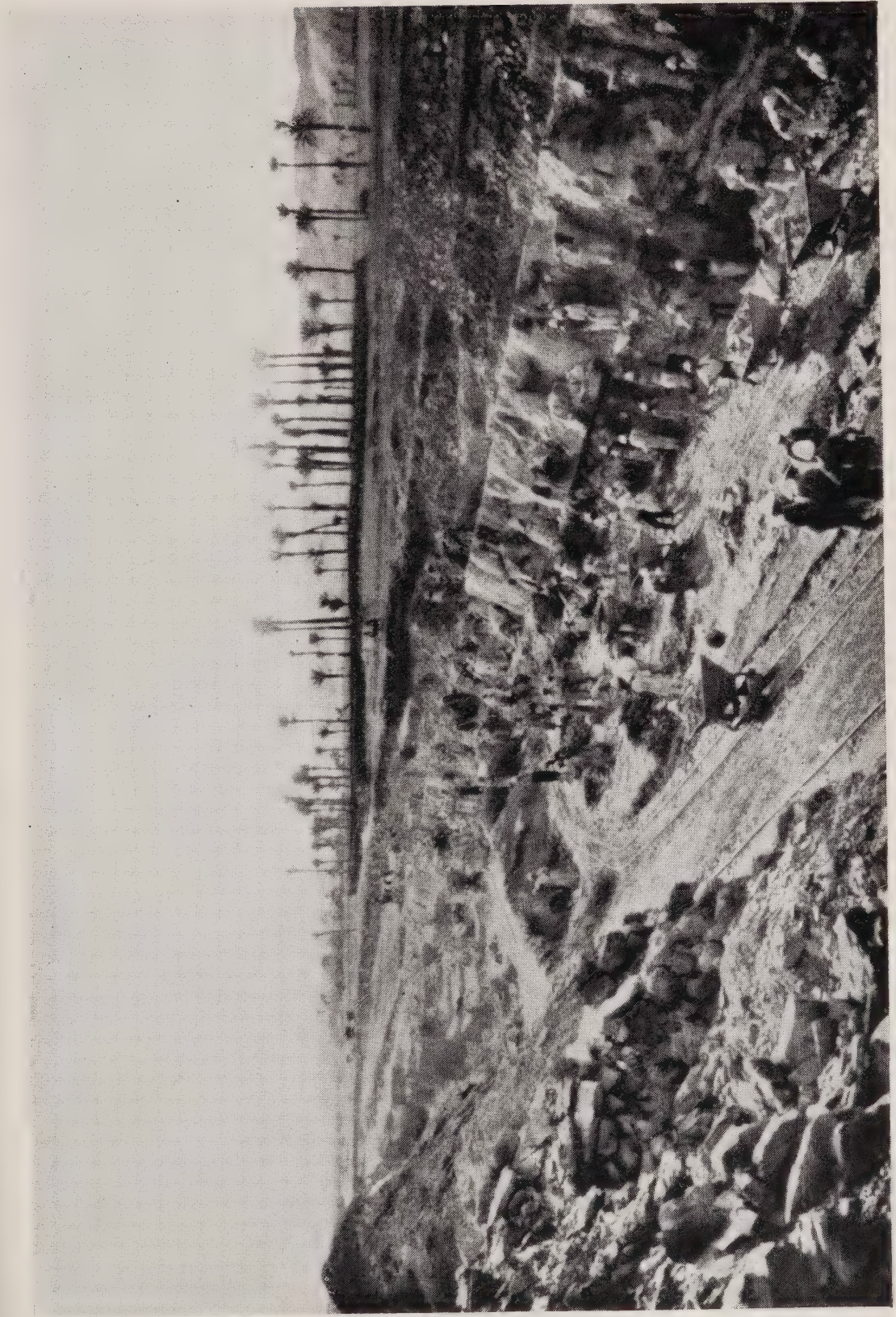
The Kenadza field forms part of the much larger Carboniferous coal basin of the Guir, more of which may be exploited when transport facilities are improved. Coal was first discovered in 1907 and has been worked continuously since the coal shortage of 1917. There are three seams, varying from 6 to 20 inches in thickness and extending over some 3,300 square miles; they dip at an angle of about

25°, and coal must be mined from inclined shafts and drifts, some of which are 1,600 feet deep. In general the thickest seam is of good quality, with 71 per cent. carbon, 22 per cent. volatiles, 3-4 per cent. ash, and 2 per cent. moisture. The mines are owned by the Chemins de fer Algériens, and much of the coal is used by the railways in the department of Oran, which consumed 7,332 tons in 1936. Production, which reached 38,000 tons in 1935 but fell to 13,190 tons in 1938, is very small compared to Algeria's total needs, which have to be made good by imports. These amounted to 707,977 tons in 1937 (excluding 813,326 tons of bunker coal). A programme of systematic boring was drawn up in 1936, and after reorganization it is hoped that the output of the Kenadza mines, combined with that of the more important Djerada anthracite field of eastern Morocco, will substantially reduce imports of coal from overseas. Imports from French Morocco have increased steadily in recent years from 14 tons in 1930 to 23,851 tons in 1938 and 34,406 tons in 1939. It is most unlikely, however, that French North Africa will ever become self-sufficient in fuel: the Algerian steam-operated railways alone used 235,000 tons in 1938, and the electrified lines consumed over 32 million units (probably equivalent to about 60,000 tons), nearly all generated from coal.

For many years Kenadza was served only by a 22-mile long extension of the narrow-gauge railway from Arzeu and Perrégaux to Colomb Béchar, but recently the normal-gauge line from Oudjda through Morocco to the manganese mines of Bou Arfa and the anthracite mines of Djerada has been extended to Colomb Béchar and Kenadza. Between Colomb Béchar and Kenadza the new line and the narrow-gauge line run side by side; beyond Kenadza the railway has been continued for about 20 miles.

Petroleum

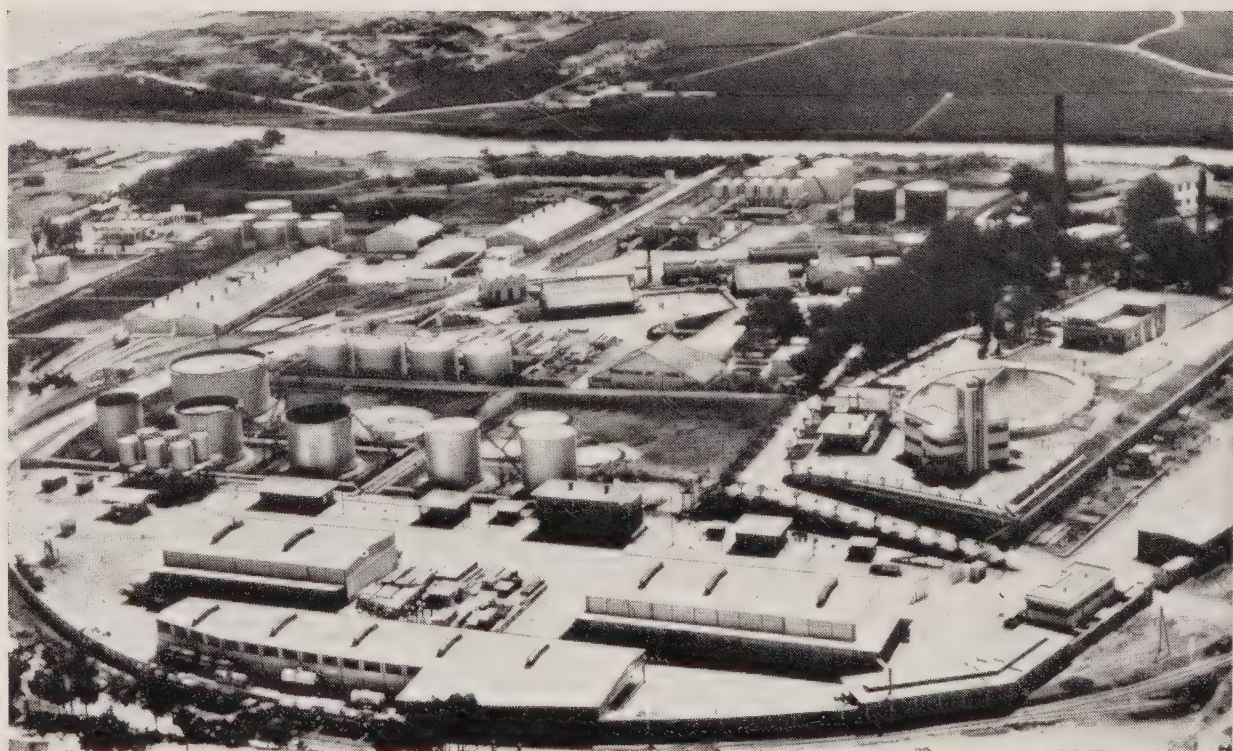
In common with the rest of north Africa, Algeria has inadequate supplies of petroleum, and despite considerable prospecting in many districts the total production is negligible. The earliest borings were undertaken in the Upper Miocene rocks on the northern side of the Chéelif valley at Ain Zeft, north-west of St. Aimé. A British company, the Oran Concession Limited, was formed in 1903, and obtained 1,445 tons of petroleum up to 1913, when production ceased. Wells were sunk, again in Miocene rocks, at Ouled Sidi Brahim, Oued Taria, and Ouarizane, and at Bel Hael, to the north-west of Relizane. Oil was discovered in the Tljouanet district (south-



55. *Kenadza coal mine*



56. *Oil-storage tanks, Bône (Avant Port)*



57. *Oil-storage tanks, Oued Harrach, near Algiers*

west of Relizane) in 1896, but production did not develop on any appreciable scale until the War of 1914-1918. Between 1920 and 1931 the annual production averaged 1,500 tons with a maximum of 3,048 tons in 1929. More recently output has declined as follows:

1932	.	.	891 tons	1936	.	.	296 tons
1933	.	.	550 „	1937	.	.	279 „
1934	.	.	375 „	1938	.	.	259 „
1935	.	.	343 „				

The crude oil is treated in a small refining unit at Arzeu (p. 135).

The most productive wells are at Messila and Medjilla, and are worked by the Société Algérienne des Pétroles de Tliouanet, a company interested in the C^{ie} Français des Pétroles du Maroc, which is developing the oil resources of the Gharb of French Morocco. Certain geologists believe that deeper boring would give more successful results: most of the wells are between 100 and 600 feet deep, though the deepest reaches nearly 4,000 feet. In eastern Algeria there have been unsuccessful borings at Sidi Aissa, St. Arnaud, Ain Fakroun, and elsewhere.

Total production, both actual and potential, is very slight compared with the country's internal consumption, which under normal circumstances amounts to about 250,000 tons per annum, mostly imported from Iraq, the U.S.A., and Roumania (cf. p. 284 and Appendix C, Table IV).

Diatomaceous Earth

Diatomite or kieselguhr, a white fine-grained earth consisting of the siliceous skeletons of the microscopic algae known as diatoms, occurs widely between Mostaganem and Ténès, and has been quarried since 1910 around St. Lucien (near St. Denis du Sig) and at Cassaigne and Pont du Chélif in the Dahra. Algeria, with an output of 15,100 tons in 1938, was the fifth largest producer of diatomite in the world, after the U.S.S.R., the U.S.A., Denmark, and Japan, and it had the second largest export trade in this commodity. Of the annual exports about one-third normally goes to France and one-third to the United Kingdom, British imports in 1938 being 6,123 tons, valued at £17,036. The earth is principally employed in the manufacture of insulating bricks, in the clarification of sugars and oils, and as a mild abrasive.

Barytes

Numerous veins of barytes occur along the coast, though only

one, at Bou Mahni near Dra el Mizane in the Grande Kabylie, is worked. The ore is exported through the port of Dellys. Production in 1938 was 3,069 tons.

Salt

Beds of rock salt are mined, and salt is extracted from the salt lakes or *sebkhas* in many districts. The principal rock-salt deposits are at Djelfa, and at el Outaya and Ouled Kebbeb in the department of Constantine. Production figures are incomplete, but average more than 60,000 tons per annum, of which some 60 per cent. is normally exported, mainly to France. The annual import of about 10,000 tons consists of refined salt.

Building Materials

Natural resources of building-stone and related rock and mineral products are plentiful throughout northern Algeria. In general the high cost of transport has prevented large developments at any one site, and all quarries depend upon local trade. The following are the most recent production figures:

Cement (1936)	. . . . .	67,000 tons
„ (1937)	. . . . .	65,000 „
Gypsum (1936)	. . . . .	45,265 „
„ (1937)	. . . . .	46,125 „
„ (1938)	. . . . .	33,325 „
Lime (1934)	. . . . .	61,000 „
„ (1935)	. . . . .	51,700 „
Marble (1935)	. . . . .	11,850 „
„ (1936)	. . . . .	9,050 „
Sand and gravel (1934)	. . . . .	390,000 „
Rubble (1934)	. . . . .	348,000 „
Limestone (masonry) (1934)	. . . . .	133,000 „
Paving and ballast (1934)	. . . . .	4,500,000 „

Details of production are given below for the departments of Algiers and Constantine, but similar information is not available for the department of Oran.

Stone. The best sources of heavy masonry are the igneous rocks along the coast near the Moroccan frontier, at Dellys (35 miles east of Algiers), and on Cap Bougaroun and Cap de Fer (west and east respectively of Philippeville). All these areas have been quarried to some extent. There are four stone quarries in the department of Algiers with an average annual production of 68,000 tons, at Bab el Oued near Algiers (32,000 tons), Bouzarea (19,000 tons), Blida (10,000 tons), and Kouba (7,000 tons); and six in the department of Constantine producing 122,000 tons—Constantine (Rocher) (32,000

tons), Sétif (30,000 tons), St. Antoine near Philippeville (20,000 tons), Herbillon (18,000 tons), Bône (12,000 tons), and Bougie (10,000 tons).

Satisfactory light masonry rocks and rock suitable for crushed aggregate are available almost everywhere. Limestones and sandstones occur widely. The quarries at Bouzarea (90,000 tons), Rivet (40,000 tons), and Camp des Chênes (10,000 tons), account for the bulk of the production of the department of Algiers (about 150,000 tons per annum). In Constantine only the Bougie district (20,000 tons) is important.

Sand, Gravel, and Ballast. Sand, gravel, and ballast are widespread. Production in the department of Algiers (137,000 tons per annum) comes mainly from Bab el Oued (60,000 tons) and from Rovigo and Témoulga (Oued Fodda) (20,000 tons each). There are also supplies at Chéraga (15,000 tons), Chebli (12,000 tons), and Aneur el Ain near el Affroun (10,000 tons). In the department of Constantine (165,000 tons per annum), Constantine (Rocher) and Bône produce 55,000 tons each, Sétif 35,000 tons, and Ain Mlila 20,000 tons.

Brick Clay. Clays suitable for the manufacture of bricks and tiles are common. About 100,000 tons per annum come from the Algiers district, 7,000 tons from Bougie, and 10,000 tons from Constantine and Bizot (6 miles north of Constantine), where there is a large plant (p. 260). There are many small brickworks, although at one time bricks had to be imported.

Cement Materials. Fair to excellent sources of argillaceous limestone suitable for Portland cement manufacture are found throughout northern Algeria. The largest of the cement works is at Pointe Pescade, north-west of Algiers, with an annual production of 45,000 tons of cement and 15,000 tons of lime. There are also plants at Batna, Rivet (near Algiers), Sidi Yahia (Bougie), and Arcole (near Oran).

Gypsum. Gypsum suitable for plaster manufacture is available in many districts. The main supplies come from Rovigo (8,000 tons), Camp des Chênes (7,000 tons), and Mouzaia-les-Mines (3,500 tons) in Algiers (total production 18,500 tons), and from el Guerrah and Constantine (5,000 tons each) in Constantine. There was a total production of 46,125 tons in 1937 and 33,325 tons in 1938. There are plants making plaster for local consumption at Fleurus and Constantine.

Road Metal. The best sources are the igneous rocks found locally in the coastal area, but quarries occur throughout the country. Two

of the largest are near Bougie and in the Chiffa gorge near Blida. Hard stone for road-making and repairing is plentiful.

Mineral Springs

Many springs have been used from earliest times, and ruins of Roman baths are common (Vol. I, p. 256). The most important to-day are the saline springs at Hammam Rirha near Miliana and the bicarbonate springs at Hammam Meskoutine near Guelma. There are other saline springs at Bains de la Reine near Oran, Hammam Melouane near Rovigo, and les Lacs on Chott Tinecilt, between Constantine and Batna; sulphurous springs at Hammam Salahine near Biskra, and Ain Mentila; and a bicarbonate spring at Hammam bou Hadjar, north-east of Ain Témouchent.

Other Minerals

Minerals yielding arsenic are found at several localities in the department of Constantine, the annual production between 1923 and 1930 ranging from 1,200 to 9,300 tons (metal content 300 to 1,600 tons). In recent years the output has been negligible through lack of demand. Deposits of china clay or kaolin occur near Bône and Constantine, in the basin of the Oued Tafna, and elsewhere: 45,000 tons were produced in 1936 and 13,700 tons in 1937. There is an exportable surplus of about 1,500 tons per year. Ores of vanadium occur at Saida (Oran) and Djebel Grouz (Constantine), but are not worked. Algerian onyx, which is not a true onyx but an onyx marble or stalagmite, is produced at Ain Tekbalet near Pont de l'Isser and at Ain Smara near Constantine. The stone is much in demand for ornamental purposes and for fancy goods, and the total quarried each year amounts to about 2,000 tons. White marble is obtained from Filfila and red marble from Djebel Orousse, but the working of the latter awaits the provision of better transport facilities. Sulphur is found associated with gypsum, the output (2,360 tons in 1936, 9,940 tons in 1937) being used principally in the manufacture of sulphuric acid.

INDUSTRY

General Industrial Development

Despite the industrial developments of recent years Algeria remains essentially an agricultural country, and the number of persons employed in industry forms only a small proportion of the total

population. The export of manufactured goods is insignificant, whereas the import trade in them is very large and in 1938 was worth 2,658 million francs out of a total import trade of 4,667 million francs. As this trade in manufactured goods is dominated by metropolitan France, which normally supplies between 90 and 95 per cent. of the total, the French Government has usually discouraged, rather than helped, attempts at industrialization in Algeria: the country has, in fact, been regarded more as a market and an outlet for the products of French factories than as a potentially industrial region. French capital in Algeria has gone into agriculture (particularly vine-growing and market gardening) and mining, not into industry. Furthermore, as shown above (pp. 249-251), Algeria's supplies of fuel and power are inadequate for the development of industry on any considerable scale: there is also a lack of skilled labour and, to some extent, of suitable raw materials. Nevertheless there have been important developments, notably in the manufacture of agricultural products, such as milling and brewing, and the present war has further stimulated production, especially since the collapse of France in 1940 and the resultant difficulties of communication between French North Africa and metropolitan France. These war-time developments, however, are unlikely to be permanent and are not considered in this chapter: brief reference is made to them in Vol. I, p. 207. In addition a number of old and established native industries have survived the flooding of the country by cheap manufactured goods: these are described on p. 263. The tourist industry, which is of growing importance in many districts, is discussed on p. 264.

The following table gives the number of factories or workshops and the number of persons employed in those industries for which figures are available:

<i>Type of industry or product</i>	<i>No. of factories or workshops</i>	<i>No. employed</i>
Flour	150	3,600
Spaghetti, &c.	54	700
Distilling of wine	50	..
Canned fish	8	1,000
Tobacco	50	..
Cork	81	..
Casks and barrels	85	1,000
Chemicals and fertilizers	4	..
Matches	2	..
Baskets	800	1,300
Tanning	54	500
Boots and shoes	15	500

Milling

Most of the towns in the interior have small mills to which the natives, who still for the most part make their own bread, bring their grain. The large flour-mills produce mainly for the European population and are generally in the chief ports. There are important centres in Algiers (four mills: two at Maison Carrée, with an annual capacity of 30,000 tons, one at Hussein Dey, and one at Hamma), Oran (in the suburb of St. Eugène), Bône, and Philippeville (in the neighbouring village of Damrémont). There are also two large mills near Constantine at le Hamma and le Khroub, and other mills in the secondary ports such as Mostaganem and in all the main wheat-producing areas (pp. 207-208). Most of the mills are on or near railway lines. Altogether there are 150 modern mills, employing 3,600 men. After meeting the internal demand for flour there is a surplus available for export, amounting in 1938 to 28,251 tons (valued at 79 million francs), nearly all of which went to France. France also took the bulk of the export of 45,965 tons of bran.

There are large and modern grain silos in several of the ports, notably in Oran, Mostaganem, and Bône. The silo at Oran has a capacity of 30,000 tons, which before the present war it was proposed to double.

Spaghetti, &c.

There are fifty-four factories, employing about 700 men, for the manufacture of spaghetti, semolina, groats, and other food pastes. The largest is at Blida, and there are several in the Algiers district, including one at Hussein Dey with an annual production of 1,500 tons. In 1938, 69,014 tons of groats and semolina (valued at nearly 201 million francs) were exported, exclusively to metropolitan France.

Brewing, Distilling, and Mineral Waters

Algeria is a producer of barley on a large scale, and there are breweries in all parts of the country. The largest are in Algiers (Hussein Dey), Oran, Constantine, and Philippeville. The Oran brewery has an annual output of 1 million gallons. Algerian beer is generally weaker than English beer.

There are fifty distilleries, the largest being at Rouiba (south-east of Algiers) and in the Mitidja at Boufarik and elsewhere. They distil the considerable quantities of wine for which foreign markets cannot be found. During the War of 1914-1918 large amounts were distilled for war purposes, when it was difficult to obtain supplies of

alcohol from overseas. In 1941, 132 million gallons (6 million hectolitres) of wine were distilled and yielded $14\frac{1}{2}$ million gallons (660,000 hectolitres) of alcohol: more would undoubtedly be distilled but for the difficulty of obtaining supplies of coal. Tartaric acid is made from the dregs of the wine: there is a large internal consumption, and also an export trade.

Aerated waters are made in Algiers, and there are ice-plants in Algiers and Hussein Dey, and at Oran, Mostaganem, Philippeville, and elsewhere. The ice is generally used for ordinary domestic purposes.

Refrigeration Plants

There are two refrigerating plants in Algiers, one near the Agha area of the port and the other (used solely for the storing of foreign meat) at Maison Carrée.

Fishing

Fish are caught off the coast of Algeria mainly during the winter (from September to March). There is a large internal consumption of fish, and also some export trade to France and Italy. In the summer fish are imported from Morocco. In 1935, 18,134 tons of fish (valued at 51 million francs) were landed and 3,873 tons (valued at over 14 million francs) exported. The export trade in 1935 and 1936 was made up as follows:

	<i>Quantities</i> (tons)		<i>Values</i> (million francs)	
	1935	1936	1935	1936
Fresh fish	735	931	3.7	5.0
Dried and salted fish	2,154	3,338	5.5	8.6
Canned fish (mainly sardines)	984	2,025	4.9	10.2

In 1937 there was an export of more than 10,650 tons of fresh and preserved fish, but the figure dropped to 5,767 tons in the following year. The fish caught are chiefly tunny (especially at Arzeu, Dellys, and off Cap Matifou, east of Algiers), sardines, allaches (a type of large sardine), and anchovies.

Details of the fishing industry in the principal ports are given below:

Nemours: 3,436 tons landed in 1936. Sardines and allaches predominate, followed by bonito. There is a special fishing-boat harbour to the west of the main harbour (p. 120).

Beni Saf: 4,051 tons landed in 1936. This is the principal fishing centre in western Algeria.

Oran: 1,755 tons landed in 1936. Most of the fishing takes place from Mers el Kebir. Sardines and allaches form 60 per cent. of the total catch.

Arzeu: 626 tons landed in 1936. Sardines, allaches, and tunny are caught, with a few bonito. There is no canning or curing industry in the port.

Mostaganem: 1,034 tons landed in 1936, mainly sardines and allaches.

Algiers: Sardines, allaches, anchovies, and mackerel are plentiful in the Baie d'Alger, and tunny are caught off Cap Matifou, but the industry has not developed on any scale. Not more than twenty small fishing-craft are based on the port.

Dellys: Tunny are caught, but only small quantities of other fish.

Bougie: The fish are chiefly sardines, allaches, and anchovies. Some of these are put in brine and sent to Port Vendres in France, or are salted and shipped to France, Italy, and other parts of Algeria. The remainder are eaten locally, sent inland (especially to Sétif, Constantine, and Biskra), or exported to Marseilles.

Philippeville (including Stora): Fish abound in the Golfe de Stora, and there are ten steam trawlers and at least 150 motor-boats. There are several canning and curing factories, and a small export of fresh fish to the south of France.

Bône: Considerable fishing takes place off Bône, but no detailed information is available.

La Calle: The coral fisheries of la Calle are described on pp. 191-192. Ordinary fishing is also important.

Canning, Curing, and Preserving

There have been considerable developments in recent years in the curing of fish and the canning and preserving of fish, fruit, and vegetables. A large proportion of the fish caught go to salting factories, which employ over 1,000 men. Nemours is the largest fish-curing centre with twelve factories, which produced 3,450 tons in 1936. Beni Saf is second with an output of 1,169 tons in 1936, and there are other centres at Mers el Kebir, Castiglione (west of Algiers), Algiers, Philippeville, and Bône. The fish canned are mainly sardines, allaches, and anchovies. There are eight modern factories employing about 1,000 workers. The largest is at Philippeville: there is another in the neighbouring village of Stora. The other factories are at Nemours (2), Oran (3), and Castiglione.

The canning and preserving of fruit and vegetables is centred in the market-gardening districts (pp. 211-213), where a number of factories have been established. The largest are at St. Charles (south of Philippeville), Orléansville, and Relizane. Relizane also has a jam factory. There is a growing export of dried and preserved fruits to France (p. 281).

Tins for the canning industry are made in a well-equipped plant at Hussein Dey: petrol tins are also produced.

Tobacco

Tobacco is being grown increasingly in Algeria (p. 210) and 18,900 tons were produced in 1938; some is manufactured in the country, but most is exported, mainly to France (18,250 tons in 1938). About fifty factories make cigarettes and cigars, the largest and best equipped being those in the ports at Algiers, Oran, Bougie, and Bône. The Oran factory produced 20 million cigarettes, 1½ million cigars, and 200,000 boxes of snuff and chewing tobacco in 1938. There was an export of 3,028 tons of cigarettes and about 100 tons of cigars in 1937, mainly to French Indo-China (65% of the total) and French West Africa (11%).

Vegetable Fibre

Vegetable fibre (*crin végétal*) comes from the leaves of the dwarf palm (doum), which grows extensively in the coastal districts of north Africa (pp. 231-232). Algeria and French Morocco have almost a monopoly in its production, but the Algerian output, which comes mainly from the department of Oran, is considerably less than that of Morocco. The fibre is used in the stuffing of chairs and bedding and in the making of harness. It is much cheaper than animal hair, but has the disadvantage of smelling like musty hay when damp. It has, therefore, to compete in some countries, particularly in the United Kingdom and the U.S.A., with coco-nut fibre, which, though less elastic, has no smell. Most of the factories for the treatment of the fibre are in Nemours and are owned by the Société des Crins: there is also a large factory at el Affroun in the department of Algiers. An agreement made in 1936 with French Morocco reduced competition between the two countries. In 1937 there was an export of 23,401 tons (valued at nearly 13 million francs) from Algeria, mainly to Italy, Germany, and France, and nearly 66,000 tons (valued at 38 million francs) from French Morocco.

Paper

Algeria is a leading producer of alfa or esparto grass, which grows wild on the High Plateaux, especially in the department of Oran (p. 219, Photo. 49, Fig. 46; and cf. Vol. I, p. 148). It is used in the manufacture of high-grade paper, but the country lacks suitable supplies of water, chemicals, and fuel to enable it to compete in the making of paper with foreign manufacturers. Consequently most of the esparto grass is exported, chiefly to the United Kingdom (227,875 tons in 1937 and 182,495 in 1938). There are small paper factories at Medjez Ahmar and Ain el Hadjar, but production has declined in recent years. The only figures available are those for the export of paper, which fell from 451 tons in 1933 to 323 tons in 1936.

Cork

The distribution of the cork oak is described in Vol. I, pp. 143-145, and its commercial production on pp. 229-230, above. Most of the cork is exported in a crude, rather than a manufactured, form. In 1938 41,858 tons of crude cork were exported, and only 4,130 tons of manufactured cork. There are eighty-one factories of varying sizes, many of them belonging to the Société des Lièges et Produits Nord-Africains. The main products are bottle corks. The centres of the industry are Algiers, Bougie, Djidjelli, Philippeville, and Bône.

Casks and Barrels

Eighty-five factories and workshops make casks and barrels; they employ more than 1,000 workers. Oran and Algiers (especially Hussein Dey) are the principal centres of this industry. Local timber is often used, though the better quality products are made from heavy chestnut imported from Italy and Spain.

Building Materials

The production of building materials has been described on pp. 252-254. Brick- and tile-works occur in many parts of the country, the largest being that owned by Constantinoise Industrielle at Bizot, 6 miles north of Constantine, and those in the main ports. There are several plaster factories, at Fleurus (between Oran and Arzeu) and elsewhere. Of the cement works the largest is that at Pointe Pescade, to the north-west of Algiers, which has an annual output of about 45,000 tons of cement and 15,000 tons of hydrated lime. There are other works at Batna, Rivet (near Algiers), Sidi Yahia

(Bougie), and Oran (at Arcole and in the suburb of St. Eugène). Production for each year since 1924 is shown in Fig. 65: the peak figure was 96,200 tons in 1934, but recently output has fallen to between 65,000 and 67,000 tons per annum. Internal production is quite inadequate for the needs of the country, and there is a large

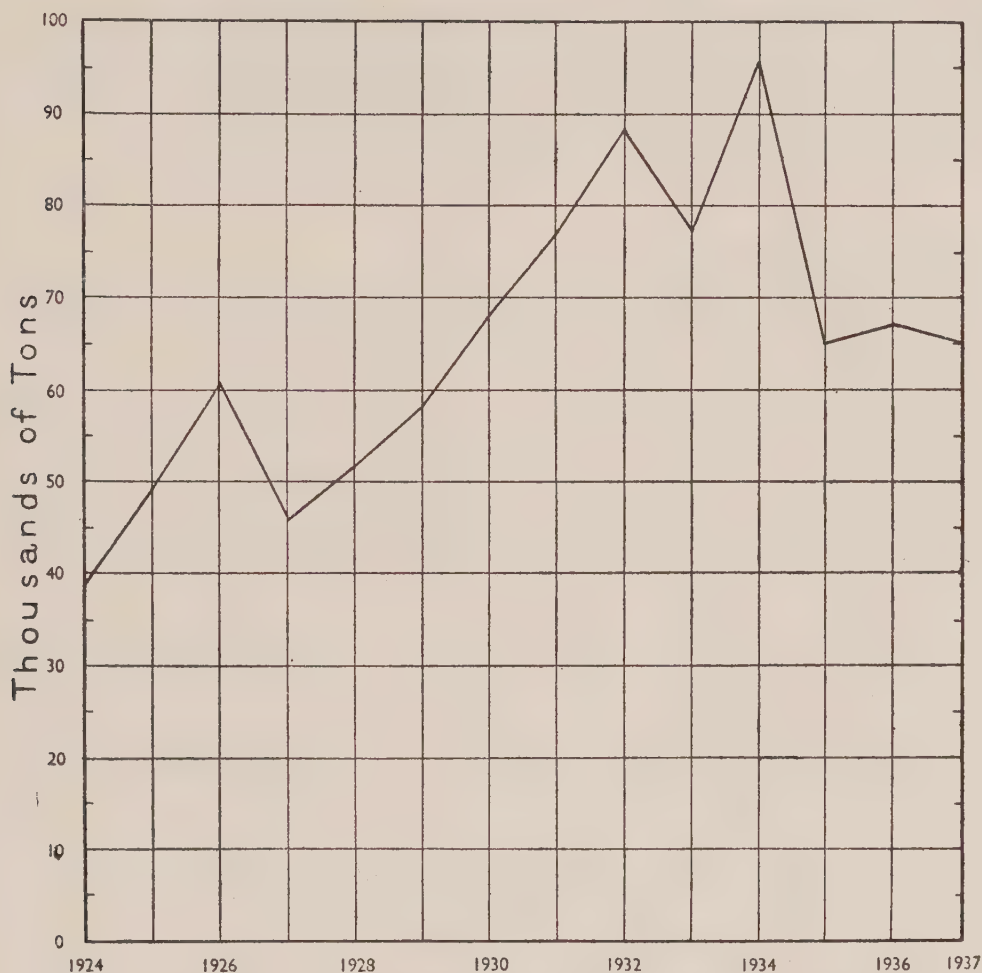


FIG. 65. *The production of cement, 1924-1937*

import each year (264,087 tons in 1936 and 203,341 tons in 1937), nine-tenths of which comes from France.

Engineering

Algeria has no iron and steel industry but a number of general engineering and repair shops. The largest of these, at Hussein Dey, employs 2,000 workers and undertakes repairs to railway rolling-stock and agricultural machinery. Another, in the Gambetta suburb of Oran, employs between 400 and 600 men. Of the railway workshops and repair depots, the largest are at Algiers, Sidi Mabrouk (Constantine), Bône, Souk Ahras, Oran, and Perrégaux (cf. p. 348). There are garages, where small repairs can be undertaken, in all the

larger towns (cf. the gazetteer, pp. 57-113). Ships can be repaired in Algiers and Oran, and trawlers and small craft up to 100 tons can be built at Oran and Beni Saf.

Armaments

Before 1939 there was no armament industry, apart from two small factories making detonators, and some Army repair depots, such as the arsenal in Algiers. The engineering works in Oran made shells during the first few months of the present war.

Chemicals and Fertilizers

The Société Algérienne de Produits chimiques et d'Engrais has three factories, at la Sénia (Oran), Maison Carrée (Algiers), and Bône: there is another factory in Algiers, near the Hussein Dey power station, belonging to the Société anonyme de l'Air liquide. The la Sénia plant, which was formerly controlled by the Kuhlmann combine, and employs about 200 men, produces sulphuric acid, superphosphate, copper and iron sulphates, and various kinds of fertilizers. The Maison Carrée plant makes the same types of products. At Bône sulphuric acid, superphosphate, carbon disulphide, and oxygen are manufactured.

The output of sulphuric acid in recent years has been much below the capacity of these factories, which is about 100,000 tons per annum. The bulk of the production is used in the manufacture of superphosphate from the phosphate rock mined in eastern Algeria (p. 245, and *see below*). The sulphur necessary for the production of sulphuric acid is obtained from the pyrites mined near Philippeville (p. 243). In 1938, 44,000 tons of pyrites were produced with a sulphur content of 21,000 tons but, as about 10,000 tons are exported each year to Tunisia, further supplies of sulphur have to be imported.

The demand for the various types of chemical fertilizers is considerable in Algeria because it is essentially an agricultural country, and the local manufacture of superphosphate supplies only a small proportion of the total needs. Algerian superphosphate usually has a phosphoric acid content of between 18 and 20 per cent. Production, which exceeded 99,000 tons in 1929, has declined in recent years and was only 51,000 tons in 1936 and 38,000 tons in 1937: of this latter figure 23,543 tons were exported, mainly to Egypt (53% of the total). In the same year 61,431 tons of phosphatic fertilizers (including 25,801 tons of superphosphate) were imported,

mainly from France, and 26,653 tons of other chemical fertilizers from France and Belgium.

Soap

The soap industry is small and unimportant, nearly all the olive-oil produced in the country being exported, mainly to Marseilles. There are factories in Algiers (2), Bougie, and elsewhere which use *grignons* (the residue of olive presses) in the making of soap, but most of the supply is imported from France (23,901 tons in 1938).

Matches

There are two match factories, one at Hamma (Algiers) and the other in Bône. Both are equipped with modern machinery.

Textiles

Production of cotton and woollen piece goods and of clothing takes place on only a small scale, and is quite inadequate for the country's needs which are made good by heavy imports, mostly from France (p. 283).

Native Industries

Native industries survive in most of the towns of the interior (cf. the gazetteer, pp. 57-113), where the artisan acts as seller as well as producer, and where much of the buying and selling is done in the markets or *souks* (p. 284). During recent years they have declined considerably, and in some places have almost disappeared, especially in the ports, where the competition of imported manufactured goods from Europe and elsewhere has to be faced. Some industries have succeeded in maintaining their position by the development of an export trade under the supervision, and with the assistance of the capital, of Europeans. A notable instance is the making of hand-made carpets, which is Algeria's leading native industry. Production for export was increasing steadily before the war, despite the obstacles of quota restrictions and high tariffs in foreign markets, as the following figures for the annual export of carpets show:

1934	.	.	289 tons	1936	.	.	460 tons
1935	.	.	379 „	1937	.	.	461 „

Those exported in 1937 were valued at over 20 million francs and found a ready sale in France, to which 95 per cent. of the total are sent. Markets are difficult to find for the better quality carpets, so the natives concentrate on the production of the lower grades..

European factories have been opened in Algiers, Tlemcen, Constantine, el Kalaa (in the Beni Chougran district), and elsewhere, but the bulk of the products come from native industries in such widely scattered places as Tiaret, el Kalaa, and Aflou in the department of Oran, Michelet and Dra el Mizane (in the Grande Kabylie), Aumale, Boghari, Teniet el Had, and Chellala in the department of Algiers, and Sétif, Msila, and Biskra in the department of Constantine.

In addition to the carpet industry, embroidery is still made on a large scale. There are at least fifty workshops, while much embroidery and needlework is done by the women in their own homes. The goods produced include collars, cushions, tablecloths, handkerchiefs, and scarves. Over 800 workshops (most of them very small) with 1,300 workers make baskets. Mat-making is an important local industry in several places. The Beni Snous people of the Tlemcen district make mats with a mixture of esparto grass and wool; special mats are also made by the inhabitants of Djebel bou Thaleb and sold in the markets at Sétif and St. Arnaud. Pottery is a very old industry in Kabylie, where the women make pots with geometrical designs stated to resemble those found in Egyptian tombs. The making of leather goods is another ancient industry: beautiful saddles and embroidered boots are still made for native chiefs, and purses, slippers, and belts produced for tourists. Altogether there are fifty-four tanneries employing 500 workers, and fifteen factories and 500 men making boots and shoes; in 1936 there was an export of 158 tons of prepared hides and skins and 131 tons of leather goods. Native woodworkers and cabinet-makers do highly skilled and artistic work on doors, panels, and ceilings, and excellent timber, such as cedar and thuya, is available in many areas. The native jewellery industry has passed largely into the hands of Jewish goldsmiths, but could be revived in some districts, notably in Kabylie and in Msila and Bou Saada.

The Tourist Industry

Algeria, with its mild winter climate and its wide variety of scenery within a comparatively small area, has much to offer the tourist. It is moreover easy of access from the south of France, the distance from Port Vendres and Marseilles to Algiers being only 410 and 463 miles (356 and 402 sea miles) respectively. There are good road and railway systems covering the country right to the northern edge of the Sahara, and special attractions such as the Roman ruins of Timgad and Tébessa (cf. Vol. I, pp. 255-260), the ancient cities of

Constantine and Tlemcen, the oases of the Mzab, and the mountainous region of the Grande Kabylie, sometimes called the 'Switzerland of Africa' by French writers. The Government has always shown a practical interest in the tourist industry, organizing hotel accommodation and propaganda in foreign countries, but numbers of tourists have declined in recent years and before the war were considerably less than those visiting French Morocco. In 1929 it was estimated that 22,000 persons visited the country for between four and twelve days, and 29,000 visitors landed from cruising vessels. The industry was severely affected by the economic depression, and in 1932 the administration established the Office Algérien d'Action économique et touristique, or 'Ofalac', to organize tourist and commercial propaganda. Large sums have been spent on improvements for the benefit of tourists and as subsidies to hotels, but even with the devaluation of the franc the number of visitors did not increase. Most of the tourists visit Algeria between the beginning of November and the end of May, and are mainly British and American: few French people visit Algeria despite the proximity of the two countries and the excellent shipping services connecting them. The number of vessels calling at Algerian ports in 1933-1935 is given below:

	<i>Total number</i>	<i>British ships</i>	<i>Other ships</i>	<i>Number landed from British ships in Algiers</i>
1933 . . .	135	56	28 Dutch, 25 Italian, 26 others	28,291
1934 . . .	124	39	85 others	..
1935 . . .	86	41	15 French, 10 German, 8 Italian, 12 others	13,456

Algiers, Constantine, Oran, Biskra, and Bougie, in that order, are the towns where most tourists stay, other than cruising visitors who stay for one day or less. There are Syndicats d'Initiative (known as 'Essi') in all the large towns and also in Biskra, Blida, Bou Saada, la Calle, Cherchel, Djidjelli, el Biar, Laghouat, Tébessa, Ténès, Teniet el Had, and Tlemcen.

Labour Resources

The lack of suitable labour has been one of the chief obstacles to industrialization in Algeria, and the position has been further aggravated by the campaign against foreign workmen, which has compelled many skilled persons to leave the country. Skilled work is still done mainly by Europeans, whose standards of living and wages are fairly high, especially amongst the French. Most of the Europeans in

industry are employed in administrative, clerical, and supervisory positions: relatively few do unskilled work, except amongst the Spanish in the Oran district and the Italians in eastern Algeria, some of whom are manual labourers in the iron-ore and phosphate mines. Skilled native labour commands good wages but is very scarce, and the natives are only gradually being trained in the habit of regular and careful work.

Unskilled labour is generally abundant, at least in the coastal areas, but it is very unreliable and unsatisfactory. Labourers and dock hands in the ports are often lazy and dishonest, and will work for only two or three days a week. Berbers from Kabylie are much preferable as workers, but are not always easy to obtain. In the vine-growing districts it is particularly difficult to find labour during July and August, when all available hands are fully employed gathering grapes. Factory workers are often attracted from industry to agriculture during the harvest by the offer of higher wages. Industrial labour also tends to be seasonal because some of the industries themselves are seasonal, such as the canning of fish and vegetables, and because many of the workers return to their own homes for two or three months each year to help their families harvest their crops. Town-dwellers form the most regular and reliable source of labour, supplemented by peoples from the interior, such as the Mozabites, who migrate to the coast for either long or short periods (Vol. I, p. 231).

<i>Occupation</i>	<i>Francs per day</i>
Motor-vehicle drivers	40
Millers	40
Bakers	34
Masons	30-40
House-painters	25-28
Hand-sewers	20-25
Cooks	40-50
Gardeners	25-30
Night-watchmen	25-27
Skilled labour (mechanics, electricians, plumbers, &c.) .	32-55
Semi-skilled labour	25-32
Unskilled labour	20

The table above, giving the daily rates of pay in Algiers in 1934, is inserted to show the relation between wages in various occupations, not the absolute rates. The latter had increased by 30 to 35 per cent. even before the outbreak of war, as a result of the rise in the cost of living and the devaluation of the franc, and since then there have been further increases, particularly since the Allied occupation of Algeria, which has enormously increased the demand for both skilled

and unskilled labour. Wages are usually fixed at an hourly rate, and the figures in the table are based on an eight-hour day. Industrial labourers are much more highly paid than agricultural workers. Thus the skilled farm mechanic received, in 1934, 16 francs per day compared with the 40 francs earned by the motor-vehicle driver in the town, and the unskilled farm labourer's 5 francs is only one-quarter of the wage received by the unskilled industrial worker.

Figures showing the distribution of labour in the various mining industries are given on p. 234.

Trade Unions

In 1932 there were 559 unions in Algeria—137 employers' unions, 225 workers' unions, and 197 agricultural unions. Since then numbers have increased, but only the employers' and agricultural unions are important. Industrial labourers do not understand the working of trade unionism, and their unions (which are affiliated to those in France) have only a limited membership. Europeans dominate the agricultural unions, which had a total membership in 1932 of 26,155, of whom less than 7,000 were natives.

POWER

ALGERIA'S main sources of power are coal, petroleum, and electricity: timber and gas are of secondary importance. In general the country is poorly endowed compared with the French Zone of Morocco, which possesses good supplies of high-quality coal and extensive facilities for the generation of hydro-electric power.

Coal

Because of the large gap between the internal production (described on pp. 249–250) and consumption of coal in Algeria, heavy imports are necessary. These amounted in 1937 to over 700,000 tons (exclusive of bunker coal), of which total the United Kingdom supplied 63 per cent. and Germany about 20 per cent. About three-quarters of all the electricity produced in the country (173 million units in 1937 and over 200 million units in 1936) is generated from coal (including that used by the electrified railway lines, equivalent to about 60,000 tons of coal); in addition, 150,000 tons of coal and 87,000 tons of briquettes were used by the steam-operated railways in 1937. In addition over 800,000 tons (nearly 918,000 tons

in 1935) of coal for bunkering are imported each year, both Oran and Algiers being leading coaling stations in the western Mediterranean (pp. 116-117). The former supplied coal to 2,553,000 tons of shipping in 1936, and the latter to 2,228,000 tons. Medium stocks of coal are usually kept in most of the ports (cf. Chap. XI).

Petroleum

The internal production of petroleum has declined in recent years, as described on p. 251, from 3,048 tons in 1929 to 259 tons in 1938, and large imports of refined products are necessary. The composition and source of these imports are given in Appendix C (Table IV). The total imports of mineral oils amounted to over 247,000 tons in 1937, including 114,000 tons of motor spirit and 83,000 tons of gas, diesel, fuel, and other residual oils. In addition 442,273 tons of gas and fuel oil were imported in 1937 for bunkering purposes (compared with 335,954 tons in 1936). A large proportion of the imports come from refineries in metropolitan France, which obtain the bulk of their supplies from Iraq and the U.S.A., but there are also considerable imports (especially of motor spirit and residual oils) from Roumania direct to Algeria.

The largest oil installations are on the coast, though there are numerous tanks in the interior. Detailed information is given in Appendix B, which refers to conditions prior to the occupation of Algeria in 1942: since then there have been extensive additions to the existing installations, but information is not available for publication. The principal coastal installations are in the ports of Algiers (Photo. 57), Oran, Bône (Photo. 56), and Arzeu: those near the sea at Hussein Dey to the east of Algiers are illustrated in Vol. I (Photo. 42). There are also storage tanks in Bougie and Mostaganem, two small tanks in Djidjelli, and a depot for packed oils in Philippeville. Information for the interior is limited to those belonging to the Shell Company, the chief of which are at Orléansville, Blida, Constantine, Affreville, Ain Témouchent, and Batna. No other town has a storage capacity exceeding 392 cubic yards (300 cubic metres).

Electricity

Of the countries of north Africa Algeria is reasonably well developed electrically, though further developments in the generation of hydro-electricity are needed to offset the country's deficiencies in coal and petroleum. Thermal production of electricity has to depend

almost entirely upon imported supplies of coal and is, therefore, concentrated in the ports. Hydro-electricity demands a steady flow of water throughout the year, a state of affairs which is rare in Algeria in view of the markedly seasonal nature of the rainfall. As most of the sites for hydro-electric stations are far inland, it would be both difficult and costly to supplement production by operating thermal plants during the summer when the water is low. The hope of the future would seem to be more in the linking together of thermal and hydro-electric plants, as, for example, the Philippeville and Constantine stations described below (pp. 275, 276).

The total power installed is at least 300,000 kW., of which the department of Algiers accounts for rather more than one-half and the department of Constantine for about one-quarter. The total output has increased from 22 million units in 1922 to nearly 203 million units in 1936 (Fig. 66). Production fell in 1937 to 173 millions. Its distribution in 1936 was as follows:

Production of Electricity, by Departments (million units), 1936

	<i>Light</i>	<i>Power</i>	<i>Total</i>
Algiers	26.4	62.8	89.2
Oran	15.9	29.7	45.6
Constantine	12.1	55.7	67.9
TOTAL	54.4	148.2	202.7

The power is used mainly for lighting and for driving tramways in the towns, for the Bône-Oued Kéberit railway, and for mining operations, especially around Beni Saf and in the iron-ore and phosphate mines of the Tunisian frontier districts. There has been considerable electrification in rural areas in recent years, the network in the Mitidja being one of the few projects for electrifying the countryside which have been carried out without the assistance of the State. The electrification of the Oran-Algiers railway has often been proposed, but has not yet been undertaken.

The main consuming areas are fairly scattered, but a high-voltage grid network is being developed to link them with the sources of supply. As there are relatively few generating stations and the transmission lines are lengthy, the sub-stations are especially important. Information about these is generally lacking, though the principal appear to be the step-up sub-stations at the main power stations, the four sub-stations on the Bône-Oued Kéberit railway (p. 347), and the stations at Tlemcen, Relizane, Miliana, and Blida.

The country may be divided into four electrical districts—Oran,

Algiers, Bône, and the northern Sahara (Fig. 67). Before the present war there was little interchange of power between these four areas, though the desirability of interconnexion is obvious in order that no district may be dependent on a single plant, and there may have been developments in this direction, as stated below. *The Oran district* extends from the Moroccan frontier in the west to

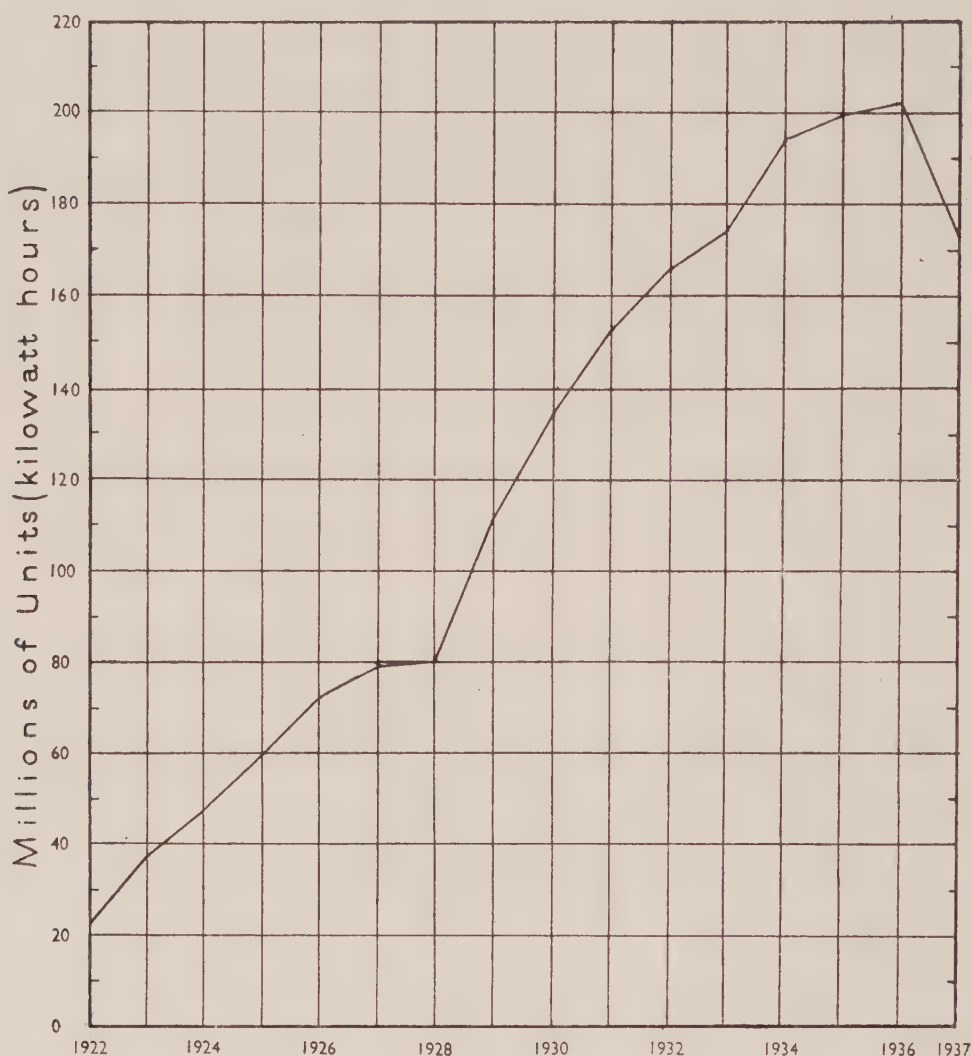


FIG. 66. *The production of electricity, 1922-1937*

Relizane in the east and obtains its power mainly from the two thermal plants in Oran. Low-voltage lines link it with the Algiers district, and the voltages may have been increased now so that the Oran and Algiers networks are completely interconnected. *The Algiers district* extends from Orléansville and Vialar (where connexion is made with the Oran network) to Bordj bou Arréridj and Bougie. There are four important generating stations—three thermal plants in Algiers, and one hydro-electric plant at Illiten in the Grande Kabylie: the other plants in the area are only small and act as sub-

subsidiary and standby stations, including the new hydro-electric station at Ain Tuizert. *The Bône district* has a large thermal station in Bône, which supplies current to the electrified railway from Bône to Oued Kéberit and to the area around Bône itself, and two medium-sized stations, which are interconnected, at Philippeville (thermal) and Constantine (oil and hydro-electric). There is a limited amount of distribution in the Constantine area. *The northern Sahara* has a few small plants at Biskra, Touggourt, and Laghouat, but their importance is only local.

The two leading companies interested in the production of electricity are the Société Algérienne d'Éclairage et de Force, the owners of the Agha and Hussein Dey plants in Algiers and of the Mers el Kebir station near Oran, and Lebon et C^{ie}, which owns the great Hamma station in Algiers and the plant in Oran. The Bône station is operated by the C^{ie} du Bourbonnais.

Fig. 67 shows the location of most of the generating stations and the main distribution networks in 1930. Detailed information of the considerable developments which have taken place since that date, especially in the generation of hydro-electricity, is not available for publication. All the areas covered by the distribution networks are fed by 3-phase A.C., at 50 cycles. Local supplies are nearly all at 115/200 volts, apart from a few districts which use 220/400 volts, or direct current (cf. headings of towns and ports in Chaps. X and XI).

There are seven large generating stations, on which nearly all the country's supplies of electricity depend. There are several smaller plants, but they are of only local importance. Many of them are linked through the grid with alternative sources of supply. Capacities are given where known, but the figures, especially of the smaller stations, should be treated with considerable reserve. Those marked with an asterisk are described more fully below.

Large Plants

<i>Type</i>	<i>Capacity (kW.)</i>
THERMAL STATIONS	
*Algiers (Agha) . . .	19,200
*Algiers (Hamma) . . .	66,600
*Algiers (Hussein Dey) . . .	17,600
*Bône	34,000
*Oran	17,200
*Oran (Mers el Kebir) . . .	24,200
HYDRO-ELECTRIC STATION	
*Illiten	10,700

Small Plants

<i>Type</i>	<i>Capacity (kW.)</i>	
THERMAL STATIONS		
Batna	170	
Biskra	170	
Bordj bou Arréridj	2,500	Two stations, one of which is an hydro-electric plant.
Bougie	1,500	A standby station.
Mokta el Hadid	(?) 1,150	Serves the iron-ore mines near Beni Saf.
Mostaganem	840	
Orléansville	2,000	
Perrégaux	1,200	
*Philippeville	1,400	
Relizane	830	
Saida	110	
Tagdempt	560	Near Tiaret and the hydro-electric station of la Mina.
Ténès	160	
Touggourt	(?) 350	
Vialar	400	
HYDRO-ELECTRIC STATIONS		
*Ain Tuizert	1,700	
Bordj bou Arréridj	2,500	Two stations, one of which is a thermal plant.
La Mina	?	South of Tiaret.
Oued Athménia	(?) 2,400	
Sétif	440	Three stations.
COMBINED STATIONS		
*Constantine	2,200	Oil and hydro-electric.
Tlemcen	2,400	Thermal and hydro-electric.

The nature and capacity of the plants at Ain Fekan, 90 miles south-east of Oran, and Laghouat, 200 miles south of Algiers, are unknown. The station at Laghouat is reported to be connected by a 60-kV. line with Ghardaia, 100 miles farther south.

Thermal Stations

Algiers (Agha). This is a steam plant, using pulverized Cardiff coal, on the Quai de Dieppe in the Bassin de Mustapha. It was built by the Société Algérienne d'Éclairage et de Force and has a capacity of 19,200 kW. Its output in 1938 was 49 million units. Power is distributed at 11 and 30 kV. The Algiers tramways are supplied from a sub-station inside the power station.

Algiers (Hamma) (Photo. 59). This is by far the largest power station in Algeria with a capacity of 66,600 kW., and in view of its position on the coast in the eastern part of the town is particularly

vulnerable from the sea. It is a thermal plant using pulverized Cardiff coal and owned by Lebon et C^{ie}. Part of the supply is generated at 3 kV. and stepped up to 10 kV.: lines at these two voltages supply Algiers and the surrounding districts. The rest of the supply is stepped up to 60 kV. and sent westward to Blida, Miliana, and Orléansville, with a branch at Miliana to Vialar, and eastward to Bordj bou Arréridj via Illiten.

Algiers (Hussein Dey). This is a steam plant with a capacity of 17,600 kW. near the sea in the suburb of Hussein Dey, about 4 miles east of the centre of the city. It is owned by the Société Algérienne d'Éclairage et de Force, and is linked up with the Hamma and Agha stations by 10-kV. lines. There is a fairly extensive distribution network in the districts to the east of Algiers as far as Michelet in the eastern part of the Grande Kabylie.

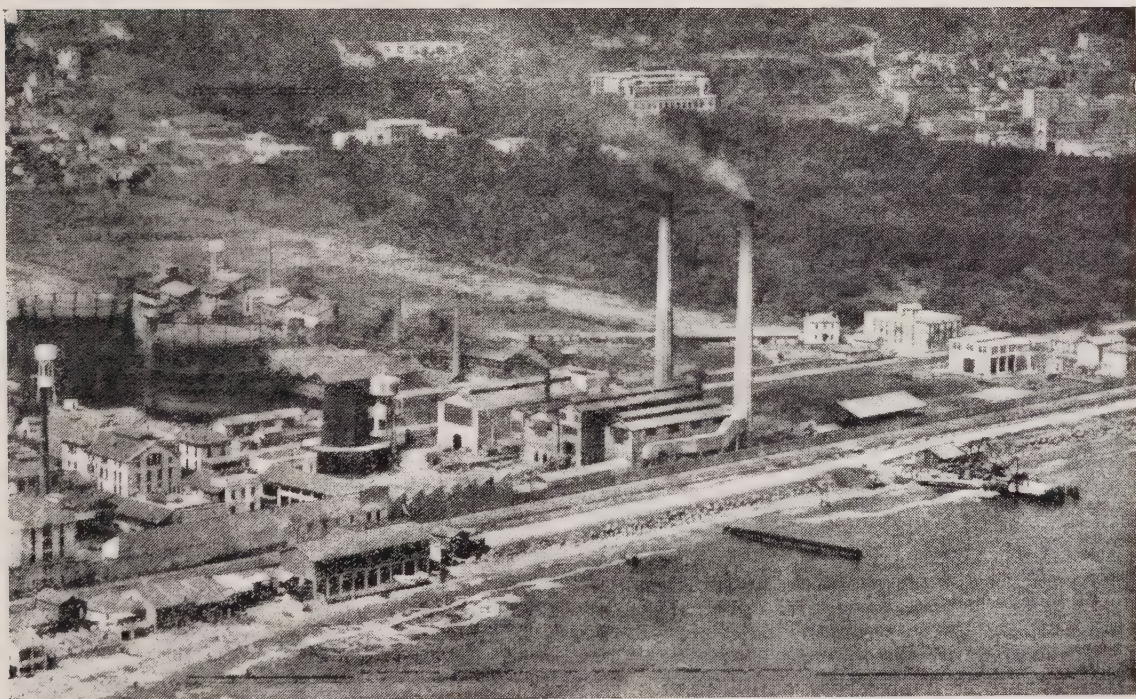
Bône. The thermal power station in Bône is on the Terre-Plein de la Seybouse, about 400 yards south-west of the root of the Jetée Sud. It is owned by the C^{ie} du Bourbonnais. The first plant was built in 1925 and had a capacity of 5,000 kW. This was replaced in 1932 by a plant with a capacity of 34,000 kW. to serve the railway line from Bône to Oued Kébérît and Djebel Ouenza (117 miles from Bône). This line was electrified to deal with the heavy mineral traffic from the Djebel Ouenza iron-ore mines, near Oued Kébérît, and the phosphate mines near Tébessa, which are joined to Oued Kébérît by a narrow-gauge line (pp. 241, 247). Power is distributed to the railway by a 90-kV. line, and there are four sub-stations, at Bône, Medjez Sfa (6 miles south-east of Duvivier), Souk Ahras, and Oued Damous (8 miles north-west of Oued Kébérît). Power is also distributed to the town of Bône at 5,500 volts, and there is some distribution at a lower voltage by lines to Duvivier and to Barral via Morris.

Oran. The Oran thermal station, owned by Lebon et C^{ie}, is on the western side of the suburb of Gambetta. It has a capacity of 17,200 kW. and had an output of 17 million units in 1937. There is local distribution at 3 kV.: the local supply is 115/220 volts. Two main trunk lines at 120 kV. were planned before the war, the western to run as far as Tlemcen, and the eastern to Perrégaux, Relizane, and Mostaganem; later information is not available.

Oran (Mers el Kebir). The station on the sea-front at Mers el Kebir is a thermal plant owned by the Société Algérienne d'Éclairage et de Force with a capacity of 24,200 kW. and an output of 30 million units in 1939. Distribution is by 6-kV. and 30-kV. lines: the local



58. *Illiten hydro-electric power station, Grande Kabylie*



59. *Hamma thermal-electric power station, Algiers*



60. *Ain Tuizert, Grande Kabylie*



61. *Ain Tuizert hydro-electric power station*

supplies are at 100/200 volts. There is an underground cable to Oran and a distribution network running roughly parallel with the coast and extending from Ain Témouchent in the west to Kléber (near Arzeu) in the east. It is probably linked with the Lebon et C^{ie} plant in Oran.

Philippeville. This thermal plant is linked with the combined oil and hydro-electric station at Constantine by a 60-kV. line, so that Constantine can supply Philippeville in the winter, and Philippeville supply Constantine in the summer (p. 276). The station is 500 yards west of the railway station and has a capacity of 1,400 kW. This plant, like that at Constantine, was enlarged in 1935, but further information is lacking, apart from a report that the capacity of the station is now 10,000 kVA.

Hydro-electric Stations

Illiten (Photo. 58). This is a hydro-electric station on the Oued el Berd, a tributary of the Oued el Dous, about 3 miles north-west of Maillot and 65 miles south-east of Algiers. It has a head of 920 feet and a capacity of about 10,700 kW., and provides useful assistance to the Algiers thermal plants during the winter, when there is plenty of water. The supply is transformed to 22 kV. and 60 kV. There is a 60-kV. or 120-kV. line to Algiers, and a 60-kV. or 22-kV. to Bordj bou Arréridj. There is a fairly extensive distribution by 22-kV. lines, the principal line being that to Bougie.

Ain Tuizert (Photos. 60, 61). Illiten was for long the only large hydro-electric station in Algeria, but there is another plant now at Ain Tuizert, a few miles north-west of Illiten. It takes its water from the Oued Boghni, and in 1938 produced 10 million units, most of which probably went to Algiers.

Proposed Hydro-electric Stations. A number of other stations have been proposed, including one at Bordj bou Arréridj, and several in conjunction with the following irrigation schemes (described on pp. 201-204; cf. Fig. 48):

the Beni Bahdel dam on the Oued Tafna, 17½ miles south-west of Tlemcen, where two plants are to be built with an annual output of 15 million units (Photo. 38);

the Oued Fodda dam near Lamartine (south-east of Orléansville), where work has already begun on the building of a power station which will have a capacity of 14½ million units per annum (Photo. 40);

the Ghrib dam on the Oued Chélif, 5 miles north of Dollfusville and 50 miles south-west of Algiers (Photo. 41); and the Hamiz dam on the Oued Hamiz (Arbatache), 4 miles south of Fondouk and 20 miles south-east of Algiers (Photos. 43, 44).

In 1938 a scheme was also put forward whereby the annual production of hydro-electricity was to be increased from 44 million units to 74 million units by the development of four waterfalls near Algiers and Oran: nothing had been done, however, up to the time of the occupation of Algeria by forces of the United Nations in November 1942.

Combined Station

Constantine. The small station at Constantine depends partly upon oil and partly upon the water of the Oued Rummel. Its capacity is about 2,200 kW. It is connected by a 60-kV. line with the thermal station at Philippeville, so that Constantine can supply hydro-electricity to Philippeville during the winter, when there is abundant water, and the Philippeville station supply Constantine during the low-water period of summer. Both stations were extended in 1935, but detailed information is not available (cf. p. 275).

Gas

In view of the shortage of coal in the country it is hardly surprising that gas is a relatively unimportant source of power. In 1936 there was an output of 2,066 million cubic feet ($58\frac{1}{2}$ million cu. metres) of gas. More than half of this was produced in Algiers and Blida. Other important gasworks are at Oran, Mostaganem, Philippeville, and Bône.

Timber

Although Algeria has considerable forest reserves (pp. 228-232), timber is used as a fuel on only a limited and a local scale. Altogether it is estimated that about 250,000 tons of logs are used for fuel per annum and 120,000 tons of charcoal. Since June 1940, however, the curtailment of imports of fuel from France and elsewhere and the general scarcity of all types of fuel have led to the cutting and burning of all timber supplies which were readily available.

CHAPTER XIV COMMERCE AND FINANCE

COMMERCE

History

Trade before the French Occupation. From the fall of the Roman Empire until the French occupation the trade of Algeria may be summed up under two heads, the caravan trade and piracy: the latter, however, can hardly be termed a commercial activity in the strict sense, except in so far as the wide depredations of the pirates were a source of great wealth to their native towns. The trans-Saharan caravan trade, on the other hand, was important from about the middle of the fourth century, when the camel, which had been introduced from Asia at about the beginning of the Christian era, came into general use, and it continued until the beginning of the present century. Fig. 68 shows the principal routes, most of which ran across the lands of modern Algeria. The merchants of such interior towns as Constantine and Tlemcen were the sole principals in the Sudan trade, and they carefully guarded its secrets. The seaports acted as feeders of European trade goods. The journey from Ouargla through In Salah to Timbuktu was regularly made, and the transverse route from Fes and Marrakech by In Salah and Ghat to Cairo also had long periods of use. The chief goods sent to the Sudan were European cloth, Moroccan sugar, clothing, brass-work, horses, and books. The return loads consisted of gold, ivory, spices, salt, ostrich feathers, and slaves.

With the gradual extension of French authority over most of the western Sahara, the caravan trade has dwindled away almost to nothing. This is due to some extent to the greater cheapness and ease of sea-borne traffic, but still more to the transformation of Saharan economy. Northern Algeria now trades almost exclusively with France across the Mediterranean, while the goods of West Africa no longer cross the desert but reach Europe by sea.

Trade since the French Occupation. French occupation brought some measure of commercial prosperity almost from the beginning, and that prosperity has been maintained and increased steadily for a century. At first Algeria was treated by France as a foreign country, but from 1835 onwards, preferential treatment began to be given. The law of 11 January 1851 admitted Algerian goods duty-free into

France, and that of 17 July 1867 proclaimed a customs union of the two countries. From that time forward the economic life of Algeria was definitely subordinated to that of France, sometimes to the disadvantage of the former, but usually to its advantage. The War of 1914–1918 did little to check the growth of Algerian trade, but the economic crisis of the nineteen-thirties was severely felt.

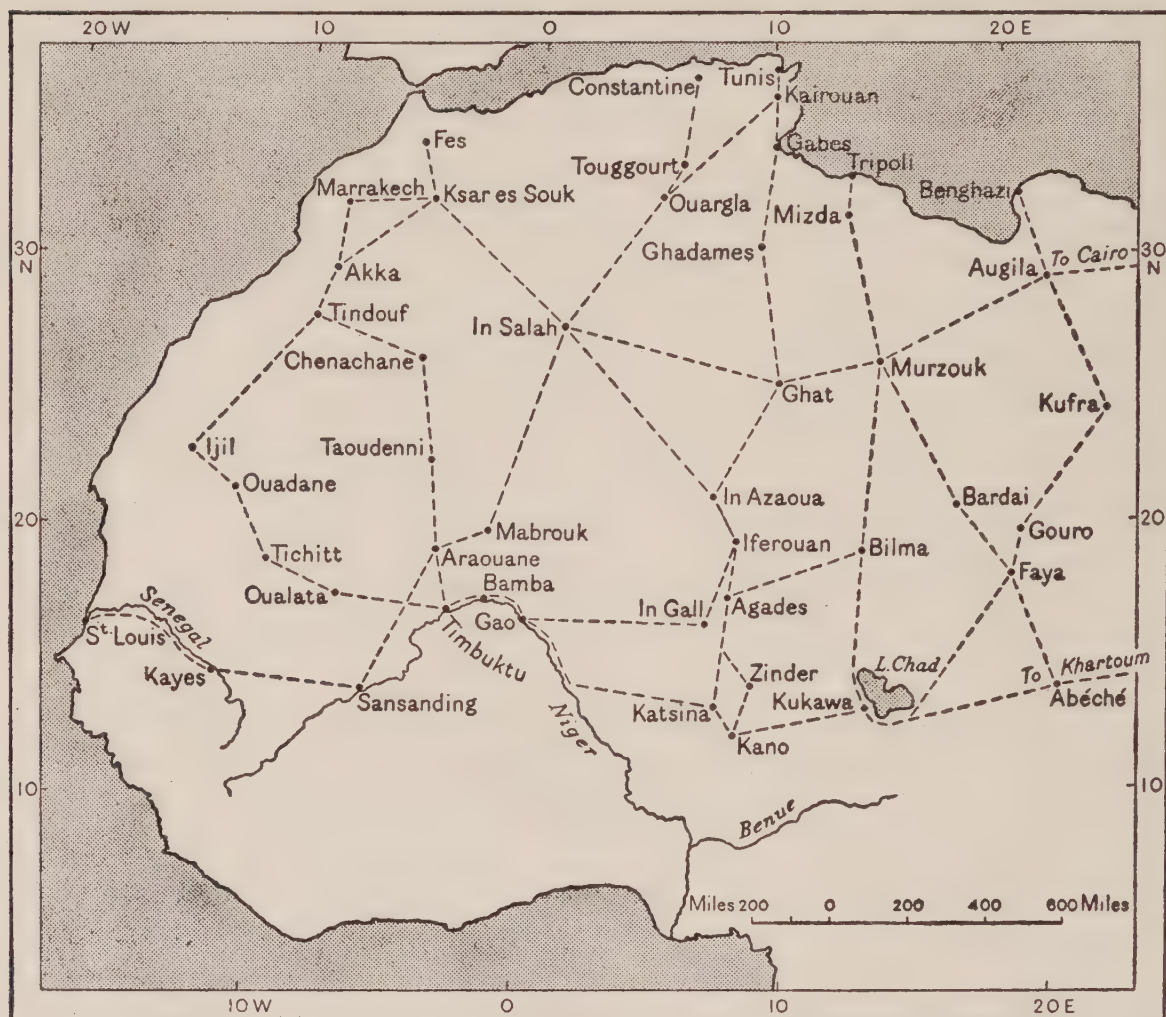


FIG. 68. *Trans-Saharan caravan routes*

In 1934 the French market for Algerian wine and wheat was almost closed. This was the result partly of a French surplus of those commodities and partly of French agreements with other countries to buy their products. At the same time Algeria was still compelled to purchase almost all her manufactured goods from France. Thus she not only lost almost her sole customer, but the balance of trade was also gravely upset. The position deteriorated during the following year because of a particularly large wine production, but in 1936 bad harvests in France and Algeria and poor yields helped to increase

the price of wine and to restore prosperity to the industry. France also assisted by taking more of Algerian products and by the institution of the Office National du Blé (p. 208). The autumn of that year saw a temporary boom, which resulted in merchants and shopkeepers exhausting many of their stocks. Replenishment from France was difficult, and French manufacturers were unable to quote prices, or even to promise deliveries, for several months ahead owing to the uncertainty of the political situation, the devaluation of the franc, the introduction of the forty-hour week, and the increase in the price of raw materials. This situation slowly righted itself, however, and conditions gradually reverted to normal.

The Balance of Trade

The outstanding general feature of Algerian commerce is the dependence of the country upon metropolitan France. At least 87 per cent. of Algerian exports are of agricultural goods, principally cereals and wine, the greater part of these being transported to France in French ships. These ships return with French manufactured goods, tropical products, and other commodities not naturally procurable in Algeria. In 1938 the exports of Algeria were valued at 5,649·7 million francs and the imports at 4,666·6 million francs, giving an adverse balance of 983·1 million francs. These figures are analysed in the table below, which clearly shows the enormous predominance of France. Fig. 69 summarizes the value of trade for the years 1929–1938. Details of the foreign trade by countries are given in Appendix C (Table I).

Imports and Exports, 1938

(Figures in thousands of francs)

	<i>Imports</i>			<i>Exports</i>		
	<i>From France</i>	<i>From other countries</i>	<i>Total</i>	<i>To France</i>	<i>To other countries</i>	<i>Total</i>
Animal products . . .	208,125	127,033	335,158	323,173	73,561	396,734
Vegetable products . .	655,772	538,544	1,194,316	4,260,665	370,932	4,631,597
Mineral products . . .	196,248	283,124	479,372	51,462	362,241	413,703
Manufactured goods . .	2,472,252	185,467	2,657,719	120,926	86,741	207,667
TOTAL . . .	3,532,397	1,134,168	4,666,565	4,756,226	893,475	5,649,701

Exports

The overwhelming bulk of Algerian exports consists of agricultural and pastoral products, especially wine, fruit, hard and soft

wheat, groats and semolina, and sheep. Other important exports are iron ore and phosphates. Details of the export trade are given in Appendix C (Table II) and the trade in the more important items is described below. France takes about 80 per cent. of the exports, which form about 11.7 per cent. of her total import trade. Algeria is in fact the main supplier of French imports, and the value of her

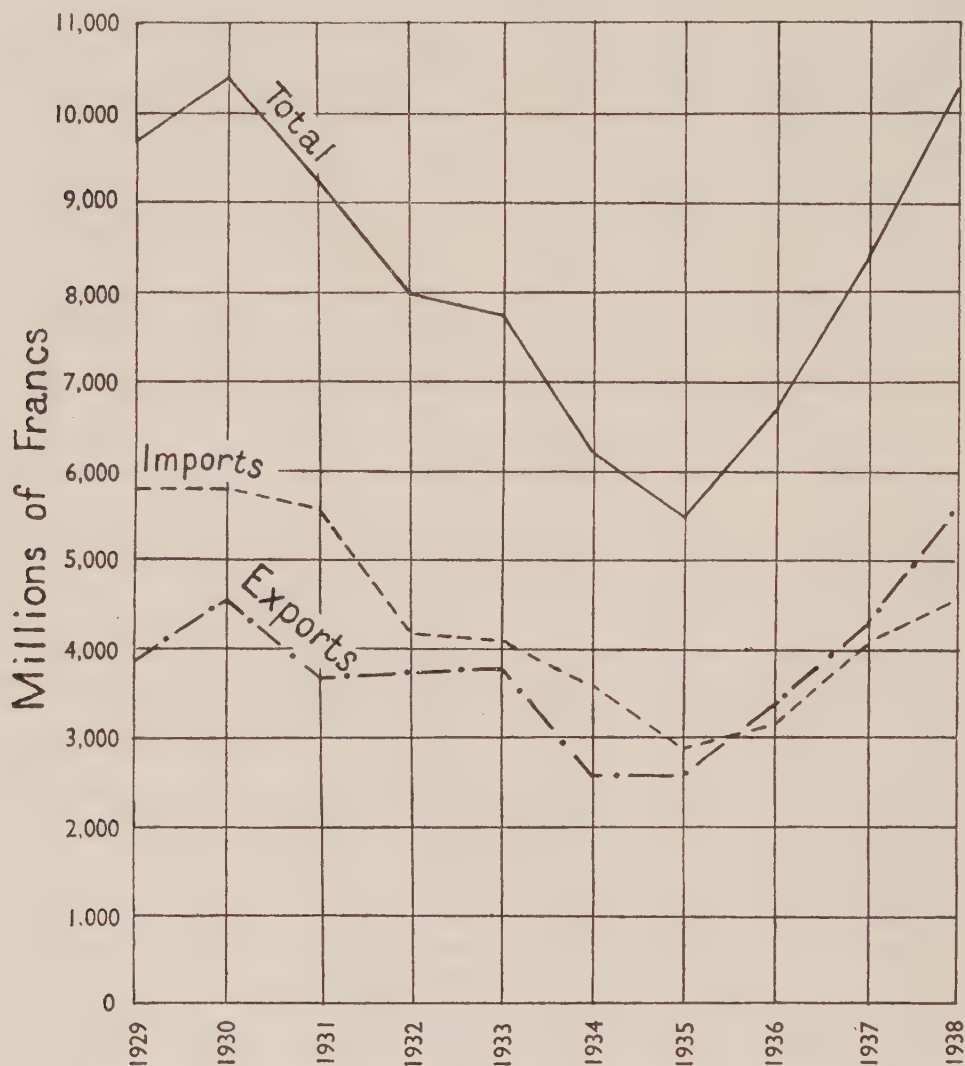


FIG. 69. *The foreign trade of Algeria, 1929-1938*

exports to France normally exceeds those of the U.S.A., France's second supplier, by some 300 million francs. After metropolitan France Algeria sends most of her exports to the French colonies and protectorates, and then to the United Kingdom, although in 1937 and 1938 the relative positions of these two customers were reversed. Germany and the U.S.A. are normally the fourth and fifth purchasers of Algerian exports.

In this chapter, as throughout the volume, all tons are metric tons.

Wheat. Exports of hard wheat have shown a sharp decline in recent

years, while those of soft wheat have remained moderately steady, as shown in the table below. In 1938 the combined export amounted to 96,765 tons worth 189.4 million francs, and over 90 per cent. went to France. Rather more than 25,000 tons of wheat flour are also exported annually. The price of wheat is fixed by the Office National du Blé.

Exports of Hard and Soft Wheat, 1936-1938

	1936		1937		1938	
	Weight (tons)	Value (francs)	Weight (tons)	Value (francs)	Weight (tons)	Value (francs)
Hard wheat	202,758	257,503,000	96,563	151,602,000	54,855	104,773,000
Soft wheat	58,675	74,517,000	64,708	107,412,000	41,910	84,658,000
TOTAL	261,433	332,020,000	161,271	259,014,000	96,765	189,431,000

Barley and Oats. The exports of barley and oats have shown astonishing fluctuations in recent years. The figures for barley were 23,859 tons in 1935, 76,893 tons in 1936, 19,141 tons in 1937, and 17,877 tons in 1938. The corresponding figures for oats were 4,480 tons, 41,144 tons, 5,467 tons, and 1,073 tons respectively.

Cereal Preparations. There is a growing export of spaghetti, groats, semolina, and other similar preparations. About 65,000 tons of groats and semolina are sent annually to France.

Wine. Because Algerian wine deteriorates with age a quick sale is essential, but owing to general overproduction in the world market, customers are often very difficult to find. Most of the wine goes to France, even though France herself is the largest producer in Europe. In 1938, 367,515,964 gallons (16,707,272 hectolitres) were exported to the value of 2,851.5 million francs, and of this total no less than 361,892,820 gallons (16,449,720 hectolitres) went to France.

Vegetables and Fruit. Algeria has many advantages as a producer of new potatoes and of other early vegetables (pp. 211-213). Exports of potatoes, nearly all of which go to France, were 78,929 tons in 1937 and 77,453 tons in 1938. The respective values were 65.5 million francs and 103 million francs. In 1937, 73,888 tons of other fresh vegetables valued at 90 million francs, and in 1938, 61,199 tons worth 115.5 million francs, were exported. Fruits, fresh, dried, and preserved, are a valuable export, 128,982 tons being exported in 1938 to the value of 326.7 million francs. The principal items were tangerines, oranges, dates, grapes, figs, and carobs (Fig. 52).

Olive-oil. The export of olive-oil has shown considerable fluctuations, the figures for 1935, 1936, 1937, and 1938 being 26,147 tons, 11,766 tons, 8,679 tons, and 24,381 tons respectively. About seven-

eighths of this is usually edible oil and the remainder industrial. For the latter the U.S.A. are a better customer than is France. In 1938 the value of the olive-oil export was 192 million francs.

Tobacco. Tobacco is exported both in leaf and made into cigarettes. The bulk of the former (18,250 tons in 1938) is taken by France, but most of the latter goes to French Indo-China and to French West Africa.

Cork. In 1937, 37 per cent. of the cork exported went to the U.S.A., 35 per cent. went to France, and 6 per cent. to Sweden. In 1938, 41,858 tons, worth 67·2 million francs, were exported.

Esparto Grass (Alfa). Exports of esparto grass amounted to 186,000 tons in 1936, 227,875 tons in 1937, and 182,495 tons (valued at 74·8 million francs) in 1938. Of this about 40,000 tons were grown in French Morocco and sent via Oudjda to the ports of western Algeria. This is one of the few Algerian exports of which very little goes to France, as the United Kingdom normally takes over 90 per cent. for the manufacture of high-grade paper.

Sheep. In 1938, 863,326 sheep were exported to the value of 148·3 million francs, together with 10,723 tons of wool, mainly carpet wool, worth 76·5 million francs. The sheep, some of which came from French Morocco, went almost entirely to France, but small quantities of the wool were taken by Belgium, Germany, Tunisia, and the United Kingdom.

Other Animals and Animal Products. A few cattle, goats, and pigs are exported, but hides and skins are more important. In 1938 exports of the latter weighed 4,626 tons and were valued at 46·2 million francs. Of this quantity 63 per cent. went to France, about 25 per cent. to the U.S.A., and 10 per cent. to the United Kingdom. In 1936, 11,372 horses were exported, and in 1937, 34,077; no statistics are available for 1938. Over 2,800 tons of eggs were sent to France in 1937. In 1938 the export of fresh and preserved fish amounted to 5,767 tons. This was a sharp decline from the previous year's figure of 10,650 tons, 23 per cent. of which had gone to Italy. There was also a small export of fresh and preserved meat.

Iron Ore. Exports of iron ore have grown steadily from 915,323 tons in 1933 to 2,754,614 tons in 1938. The United Kingdom normally purchases over 50 per cent. of this and Germany about 30 per cent. Algeria was the United Kingdom's chief source of iron ore in 1936 and 1938, although Sweden occupied first place in 1937 (p. 236).

Phosphates. In 1937, 572,308 tons of phosphates were exported, mainly to France, Germany, and Eire, and 23,543 tons of super-

phosphate, mainly to Egypt, Tunisia, and Belgium. In 1938, 485,579 tons of phosphates were exported to the value of 44·2 million francs (p. 249).

Other Minerals. Other ores exported include those of manganese, lead, and zinc (cf. Chap. XIII). There is also some export of diatomaceous earth or kieselguhr (p. 251). Exports of salt, mainly unrefined, average about 40,000 tons per annum: in 1937, 62 per cent. of the total went to France, 12 per cent. to Finland, and 11 per cent. to the U.S.A. Nearly 100,000 tons of anthracite from the mines at Djerada in French Morocco were exported in 1938, mainly through the Algerian port of Nemours to France and Yugoslavia.

Imports

Algeria's imports consist mainly of manufactured goods of all sorts, fuels, tropical products, and other commodities not produced in the country. The more important are described below, and details of the import trade are given in Appendix C (Table III). About four-fifths of Algeria's imports come from metropolitan France, 17 per cent. of whose export trade is with Algeria. The French colonies and protectorates and the United Kingdom occupy the second and third places to France, followed by the U.S.A., Brazil, Belgium, and Germany (cf. Appendix C, Table I). Germany's import trade with Algeria declined considerably in the years before the war, and the U.S.A. lost the high place (third) which she held in 1931.

Algeria has a certain amount of transit trade, goods such as minerals (mainly anthracite and manganese), livestock (especially sheep), and esparto grass coming in from French Morocco and being re-exported in the manner described above. There is a small overland trade between Tunisia and Algeria.

Metal Goods. Iron and steel goods are almost exclusively of French manufacture. In 1938, 20,367 tons of machinery, 10,754 tons of motor vehicles and bicycles, and 77,533 tons of other iron and steel goods were imported, with a total value of 517·2 million francs. Other metal goods weighed 44,129 tons and were worth 197 million francs: these too came mainly from France.

Textiles. Cotton and rayon tissues, jute sacks, and ready-made clothing of European style are the principal textiles imported; the cotton is used mainly for native garments. The imports of cotton tissues totalled 13,095 tons in 1938 and were valued at 383 million francs.

Fuel. The United Kingdom normally supplies more than 60 per cent. of Algeria's coal requirements, the bulk of the remainder coming

from Germany, with some from the newly developed Djerada anthracite field of French Morocco, near the Algerian boundary (23,851 tons in 1938 and 34,406 tons in 1939). In 1937 imports amounted to 709,521 tons, of which 447,000 tons came from France and the United Kingdom. In addition there was an import of 813,326 tons of bunker coal, mostly supplied by the United Kingdom. The import of coal, excluding bunker coal, was 701,178 tons in 1938. Imports of motor spirit and kerosene totalled 47,043,328 gallons (2,138,334 hectolitres) in 1938. Of this some 70 per cent. came from France and the remainder from Roumania, but most of the imports from France came originally from the Netherlands West Indies, the U.S.A., and Iraq. In the same year 92,756 tons of lubricating and other heavy oils were imported, chiefly from France, the U.S.A., Roumania, and Persia. A more detailed statement of the imports of mineral oils to Algeria is given in Appendix C (Table IV).

Timber. Timber comes from France, Yugoslavia, Sweden, and Italy. Most of it is already shaped and sawn. In 1938 its total weight was 132,094 tons and its value 102.1 million francs.

Foodstuffs. Sugar, rice, and dairy produce are all imported, and there is also some import of such products as cereals, potatoes, and livestock, of which Algeria is an exporter. Some of these, as explained above, are from the neighbouring protectorates for re-export. Ground-nut oil to the value of 120 million francs was imported in 1938. The bulk of this was produced from French West African ground-nuts, but over 80 per cent. of it came via refineries in France. There is even an import of dates from Iraq, it being cheaper to transport them to northern Algeria from Iraq by sea than from the Saharan oases by land (cf. p. 219).

The only other noteworthy imports are soap and perfumery, medicines, rubber goods, and paper. In each case the greater part is of French origin.

Internal Trade

In the past many tribes were almost or entirely self-supporting; but, even so, trade between different parts of Algeria has always been important. The dates of the south, for example, have been bartered for the wheat and mutton of the north for many centuries. Much of this trade survives, although the motor lorry has ousted the camel and the mule. In many parts of the country weekly and even daily markets (*souks*) are held, where local farmers sell their produce and pedlars and hawkers cry their wares. The village shopkeeper, who is often

a Jew, tries to keep abreast of the times, and sells bicycle tyres and sewing machines as well as more traditional articles.

Shipping

Shipping between Algeria and France is wholly reserved for French vessels, and the absence of competition has resulted in freight charges being considerably higher than current world rates. As the annual cost of shipping cargoes from Algeria to France is approximately 300 million francs, the French mercantile marine is thereby indirectly subsidized by the colony. Since 1929, moreover, Algeria has made an annual contribution of 2·5 million francs towards a fund for the replacement of eight passenger ships which are owned by the French Government and ply between France and Algeria. This fund is at the disposal of the French Government, and the ships are leased, at an annual rate varying from 550,000 to 800,000 francs, to three private companies: the C^{ie} générale Transatlantique, the C^{ie} de Navigation mixte, and the Société générale de Transports maritimes. The main shipping services run by these companies are listed on pp. 421-423.

In 1938, 3,956 ships with a total tonnage of 7,163,000 entered Algerian ports. Of these 2,853 were French with a total tonnage of 5,020,000. Details of the shipping of individual ports are given in Chap. XI.

The Algerian Merchant Fleet. In 1936 the Algerian merchant fleet consisted of 1,056 vessels with a total tonnage of 75,154 of which only 359 vessels totalling 59,128 tons were propelled by steam. The figures for 1937 were 1,080 vessels with a tonnage of 76,746.

Foreign Ships. The only ships of any importance, other than French and Algerian, are British. In 1936, 581 British vessels with a total tonnage of 1,555,672 called at Algerian ports.

Destinations. Some 54 per cent. of Algerian overseas trade is with Mediterranean ports, chiefly Marseilles, and some 40 per cent. with other European ports.

FINANCE

REVENUE AND EXPENDITURE

The Budget

Algeria was first given an independent budget in 1839, but this privilege was withdrawn in 1845 and not restored until 1900. In the

early stages of the French conquest of the country it was estimated that France was incurring an annual loss of 70 million francs over Algeria. Sound financial methods, however, coupled with a proper pride in financial autonomy, altered this; and, although the budgetary position of Algeria has never been outstandingly strong, in most years receipts have slightly exceeded expenditure. Until 1921 the budget was balanced every year, but between 1921 and 1926 there were recurrent deficits, in spite of frequent loans from the French Government. From 1927 until the outbreak of war there were again budget surpluses each year. The healthy nature of Algeria's financial position is, however, more apparent than real, since, as explained below, it is largely due to the fact that metropolitan France has in the past paid entirely for many of the country's services.

In 1904 the Algerian budget was almost completely severed from that of France, and the only charges on the metropolitan country in normal times are for the armed forces, for a subsidy to the Territoires du Sud mainly for military expenditure (p. 14), and for part of the pensions of retired officials. There is also a special arrangement regarding the guarantees of interest on the railways. The law of 1900, which created a separate budget for northern Algeria, placed these expenses to the charge of the French Government until 1926, and after that to the charge of the Algerian administration, but this settlement was revised in 1904. Since 1905 Algeria has had both the expenses and the profits of the railways, and has received from the French Government an annually decreasing subsidy, which is due to cease entirely in 1946. In return for this help from metropolitan France Algeria has made since 1915 a grant towards the military and naval expenditure of the territory: the rate was fixed in 1920 at 6 per cent. of the ordinary budget for ten years. Further information regarding the Algerian budget and of the control exercised by the Délégations financières is given on pp. 6-7.

Algeria's financial history, though not particularly brilliant since its acquisition of a separate budget, has been more fortunate than that of most parts of the French Empire. Elsewhere the infant colonies have usually had to struggle under a heavy burden of debt and have had to raise most of the money for development at their own charges. Algeria, in contrast, has not only been conquered, pacified, and settled at the direct expense of metropolitan France, but has also had railways built and subsidized by the mother country. In this way the debt charges have never been excessive and have not proved a handicap to the administration.

Revenue

*Thousands of
francs*

I. Taxes and Duties

Direct taxes	.	.	.	.	.	.	.	.	221,988
Assimilated taxes	.	.	.	.	.	.	.	.	18,020
Registration tax	.	.	.	.	.	.	.	.	235,402
Stamp taxes	.	.	.	.	.	.	.	.	92,474
Tax on income from transferable securities	.	.	.	.	.	.	.	.	56,629
Customs duties	.	.	.	.	.	.	.	.	276,610
Sundry taxes and duties	.	.	.	.	.	.	.	.	739,077
									1,640,200

Mines and quarries	22,600
Forests	26,852
Other property	13,276
									62,728

3. <i>Sundry Receipts</i>	52,763
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4. <i>Exceptional Revenue</i>	1,160
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5. <i>Grants and Subsidies</i>	160,200
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TOTAL of Ordinary Revenue	1,917,051
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Receipts allotted to the guarantee of the expenses of the public works programme	624,000
Receipts allotted to the guarantee of exceptional expenditure	9,000
Garde républicaine mobile (building of barracks)	46,000
Share of the ordinary budget in the extraordinary budget	19,595
Receipts allotted to Algerian defence	8,000

TOTAL of Extraordinary Revenue	706,595
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[illegible]

*Expenditure**Thousands of
francs**Ordinary Expenditure*

Debt charges	569,269
Government-General and central administration	203,190
Administration of departments	9,342
Public health	79,416
Interior	23,085
Justice	32,797
Education: Europeans	162,226
Natives	45,749
Technical and professional instruction	6,078
Prison service and public security	37,724
Gendarmerie and garde républicaine mobile	64,366
State police	42,737
Native affairs	57,244
Treasury	7,391
Customs	25,984
Direct taxes and cadastral survey	12,921
Sundry taxes and tobacco	55,950
Registration, domain, and stamps	15,741
Refunds, &c.	8,313
Deficit on posts, telegraphs, and telephones	95,579
Public works, railways, shipping	306,571
Economic services (agriculture, colonization, survey, trade, labour)	46,005
Waters and forests	35,151
Contingent expenses	1,250
TOTAL	1,944,079
Abatements having the effect of credits	28,000
TOTAL of Ordinary Expenditure.	1,916,079

Extraordinary Expenditure

Public works	445,000
Expenditure on special loans	235,000
Exceptional expenditure	26,595
TOTAL of Extraordinary Expenditure	706,595
GRAND TOTAL	2,622,674

Taxation

Moslem Taxes. For centuries the people of Algeria paid the traditional Moslem taxes, particularly the *zekat* ('purification') and the *ashur*. The former was nominally a voluntary gift of a percentage of movable capital such as coined money and livestock: the latter was a tithe, supposed to be paid in kind, of the produce of the harvest. In practice, both were rigorously exacted by the local cadis and either passed on or retained by them according to the strength of the reign-

ing dey. There were also two other taxes authorized by the Koran: one was the poll-tax (*jéziya*) on the infidel, and the other the land-tax (*kharaji*) paid by conquered peoples for the right to cultivate their former land. All these taxes continued to be paid during the early years of French administration, and, though modified, were not finally abolished until 1918. To a very large extent they

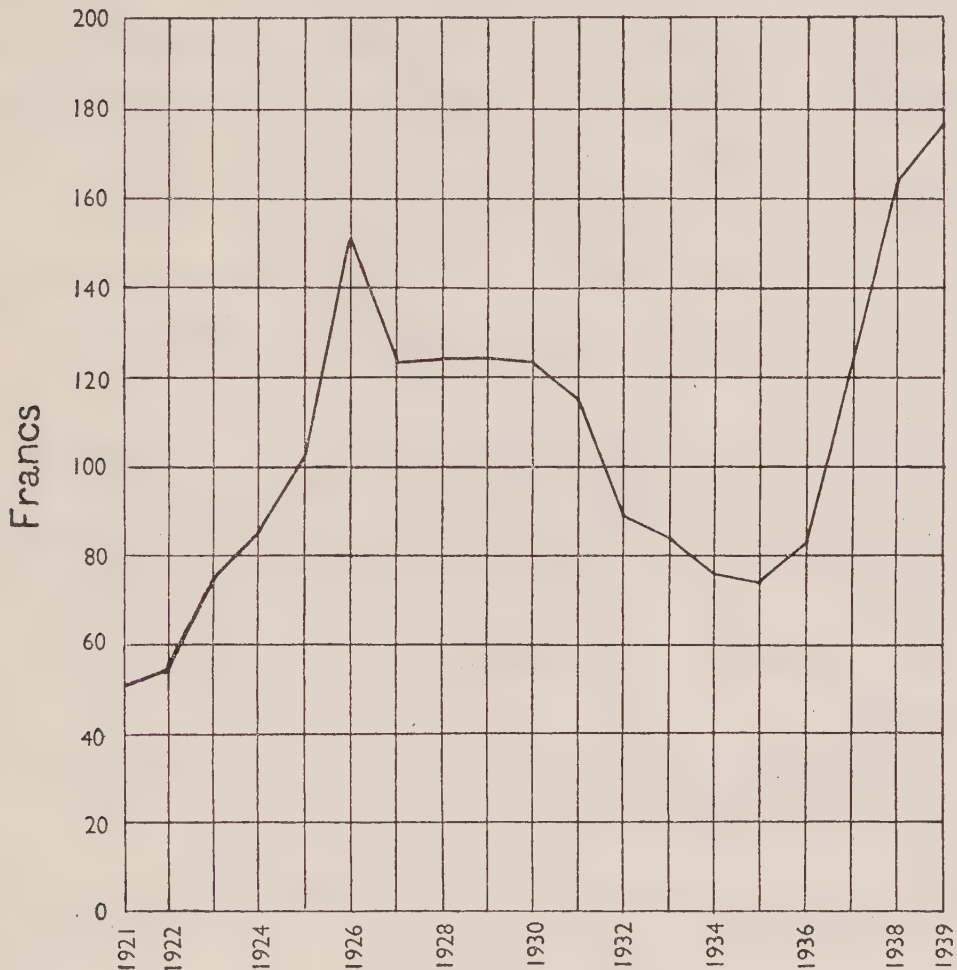


FIG. 70. *The value of the £ sterling in francs, 1921-1939*

survive in the Territoires du Sud, which has a separate budget (pp. 14-15).

Modern Taxation. Algerian taxes are very similar to those of France, but the rates of taxation are usually lower. There is a graduated income tax, an 8 per cent. tax on the circulation of goods, and also a tax on rental values. Owing to the method of assessment the last-named falls only lightly on farmland and on urban land without buildings. Indirect taxes are imposed on such items as matches, tobacco, and alcoholic drinks, and there is a big range of customs and excise duties. In 1938 customs duties realized

602 million francs. Mineral royalties also bring in a considerable annual revenue.

Loans

Debt charges form the largest single item of the expenditure and total about 500 million francs in most years. Almost the whole of this sum is paid to French bondholders. From 1902 to 1929 only 830 million francs were borrowed, but the next six years saw an enormous increase in the amount of loans, which were raised almost entirely in France. In January 1930, 601 million francs were raised; in October 1930, 249 million francs, and in 1931, 701 million francs. Five other loans followed, the last being in October 1935, to bring the grand total up to 5,850 million francs. These huge sums were chiefly spent on public works, the materials for which were bought from France.

Special Budgets

Territoires du Sud. Since 1902 the Territoires du Sud have had a separate civil budget, the revenue coming mainly from taxes, especially Arab taxes, which have been maintained largely in their traditional form (cf. pp. 14-15). Most of the expenses are military, and these are borne entirely by the French Ministry of War: no figures are published.

Posts, Telegraphs, and Telephones. In 1925 a supplementary budget for posts, telegraphs, and telephones was first introduced. In 1939 this balanced at 295 million francs.

Departments and Communes. The budgets for 1939 of the departments of Algiers, Oran, and Constantine, and the budgets for 1939 of the communes in these departments and in the Territoires du Sud are shown below:

Departmental Budgets, 1939

(Thousands of francs)

	<i>Ordinary Revenue</i>	<i>Extra- ordinary Revenue</i>	<i>Total Revenue¹</i>	<i>Ordinary Expenditure</i>	<i>Extra- ordinary Expenditure</i>	<i>Total Expenditure</i>
Algiers .	43,056	4,323	62,023	37,401	21,169	58,570
Oran . .	42,640	22,633	87,190	49,578	21,705	71,282
Constantine	32,763	7,009	44,738	35,997	6,856	42,854
TOTAL .	118,459	33,965	193,951	122,976	49,730	172,706

¹ Including the balance in hand from the previous year.

Communal Budgets, 1939

(Thousands of francs)

	<i>Balance from previous year</i>	<i>Revenue</i>	<i>Total</i>	<i>Expenditure</i>
Algiers . . .	75,733	204,574	280,307	231,491
Oran . . .	78,904	148,609	227,513	175,398
Constantine . . .	61,088	150,387	211,475	161,032
Territoires du Sud . . .	2,636	16,333	18,969	16,382
TOTAL . . .	218,361	519,903	738,264	584,303

BANKING AND CURRENCY

Banking

The Bank of Algeria. The Bank of Algeria (Banque de l'Algérie), founded in 1851, is a state establishment and performs in Algeria those functions carried out by the Bank of France in France itself. It has ten main branches and twenty-five minor branches, mainly in the principal towns; its capital is 20 million francs; and in 1937 it encashed and discounted a total sum of 14,385 million francs (£88,252,100). In the past it has been of the greatest assistance in financing the country's development.

Loan Banks. The Land Loan Bank of Algeria and Tunisia (Crédit Foncier d'Algérie et de Tunisie) was founded in 1881, and exists, as its name implies, primarily to make loans to farmers. On 31 December 1937 its position was as follows:

	<i>Millions of francs</i>
Bills and acceptances:	
In-coming	11,628.3
Out-going	10,537.9
Balance	1,090.4
Mortgaged loans realized in participation with the Crédit Foncier de France:	
Total	967.2
Repayments	449.9
Mortgaged loans with the company's funds	1.3
Loans:	
to departments	37.5
to communes de plein exercice	55.5
to communes mixtes	1.7
to public establishments	27.6
to irrigation syndicates	0.8
of seed	6.3
educational	1.5
TOTAL	130.9
Repayments and amortizations	99.8

As in many other Moslem countries, native money-lenders charge high rates of interest. The system of weekly payments called *la petite semaine* is widely prevalent. The trade depression of 1934 and 1935 caused so many bankruptcies of native farmers and so much distress that the administration had to intervene. By a decree of October 1935 all the smaller loan banks were centralized and formed into a Central Loan Organization. The main purpose of this was to facilitate the allotment of the credit of 800 million francs guaranteed to Algerian farmers by the French Government.

Other Banks. Various private banking companies operate in Algeria. In 1937 the Crédit Lyonnais encashed and discounted a total sum of 1,827.2 million francs, the C^{ie} Algérienne 3,344.7 million francs, the Société Générale 1,112.3 million francs, the Banque Industrielle de l'Afrique du Nord 582.1 million francs, the Société Marseillaise 521.1 million francs, and Barclays Bank (Overseas), Ltd., 72.4 million francs. The last-named had branches at Algiers and at Oran.

Currency

The sole legal tender is the Algerian franc, which is tied to the French franc (Fig. 70). The Bank of Algeria is the only bank of issue, and by a law of 9 April 1932 its note circulation was limited to 3,000 million francs. In spite of this, however, the fiduciary issue in June 1939 (the latest figure available) was 3,036 million francs.

CHAPTER XV

ROADS

THIS account is a general picture of the road network of the country and no detailed itineraries are included, although all the main roads (most of them Routes Nationales) are described in the appropriate sections. Conditions have been such in the country since the Allied occupation that many roads have probably been extensively altered and others built to serve the special needs of the time at which this account is written. There is, therefore, no object in including particulars which are not only doubtful but would probably be obsolete in the course of a few months. Topographical details of the major roads of the country may be found when required on the 1 : 50,000 and 1 : 200,000 maps of the country, and these should be consulted by those who require more information than can suitably be given here. Most of the roads included in this chapter are shown on the map on the scale of 1 : 2,000,000 in the pocket at the end of the book, or in Figs. 71-73.

History

There have been roads in this part of north Africa since very early times, and under the Roman Empire the country was provided with an adequate network of major highways, described in Vol. I (pp. 259-260, Fig. 46). These have, in general, disappeared, though many traces remain, such as milestones, and in some places even stretches of pavé. The routes used are followed, often remarkably closely, by the modern network in its broader outlines. The natives still use animals rather than wheel traffic, asses, mules, and horses being common in the north and camels in the south, and because of this the country was for a long time without good roads. There were only pathways across the scrub, or tracks which were impracticable after the first heavy rains. Roads in such a country worked miracles, and their usefulness was obvious from the first to the military governors. French influence spread rapidly once communications were established. Motor transport is becoming more and more general now, and this has made imperative the construction of good roads.

During the early days of the French occupation the principal work of the army was to open strategic roads. These routes were also

important in the colonization of the country. In 1864 the building of five Routes Nationales was undertaken. Some years later, between 1880 and 1891 in the period of *rattachement* (p. 3), road works, like all other public works, lapsed, but a new effort was made after the voting of a special budget. By 1911 Algeria had a road network of about 12,500 miles. At the end of 1927 there were twenty Routes Nationales of a total length of nearly 4,000 miles and in addition 8,000 miles of 'chemins de grande communication' and 9,000 miles of 'chemins vicinaux ordinaires'. In 1939 the Routes Nationales covered more than 4,200 miles, and secondary roads about 25,500 miles. In 1929 there were about 50,000 motor-cars in Algeria and their number was increasing by five or six thousand each year before the outbreak of war. About 600 buses and 5,000 lorries served about 12,500 miles of fixed routes. In 1937 there were 12,490 motor cycles and sidecars, and 123,633 lorries, buses, and motor-cars.

Road construction in all parts of north Africa encountered great obstacles. The road network was difficult to construct, and the cost and upkeep were twice as heavy as in France. For example, the cost of construction of the road from Bougie to Djidjelli, one of the finest stretches, was nearly 60,000 francs per kilometre (over £500 per mile). The relief and the clayey nature of much of the land in the Tell make roads difficult both to construct and maintain, and the heavy rains break up the surface of even the best. In winter the ground subsides, and landslides occur in undulating as well as in mountainous country. Large bridges are necessary over streams which are usually insignificant, but which, in time of flood, become rushing torrents capable of destroying bridges and viaducts.

The improvement of the existing roads has been of particular importance in recent years. Many of those in highland districts were built hastily and are soon damaged in the bad weather of the winter months. On the whole, neither the size nor the direction of the roads meets the actual traffic needs, especially with the increase in the number of cars and lorries. Much work has been done on certain routes, though much remains to be done. The intensity of the traffic naturally varies from place to place, but it is generally quite large and its development increases the problem of the upkeep of the roads.

Road Network

The road network is closest in northern Algeria in the region of greatest population, and this part of the country is well served by main roads. The physical features are reflected to some extent in the

general layout. In the north there are two very important main routes running right through the country from west to east—the coastal road with its concentration on the ports, and the main inland route: the latter follows the natural routeways through the interior, and passes through Algiers and Constantine; it has connexions with all the main ports. From these two main routes there are roads southward to the High Plateaux and Saharan oases.

The pattern of major west-east trunk routes, crossed by a series of north-south roads linking the ports eventually with the main centres of the High Plateaux and of the Saharan Atlas, is maintained generally throughout the country, except that the influence of the great ports of Oran and Algiers has deflected the main inland highway towards the coast, and away from its natural route. The network is described below in more detail in a series of regions which correspond as far as possible to the grouping of the major physical features, but inevitably there is a certain amount of overlap.

The main strategic roads are:

- (a) the coast road from Oran to Bizerta and Tunis through Mostaganem, Ténès, Cherchel, Algiers, Bougie, Djidjelli, Philippeville, Bône, la Calle, and Tabarka;
- (b) the main interior road from Casablanca to Tunis through Oudjda, Tlemcen, Sidi bel Abbès, Mascara, Relizane, Orléansville, Affreville, Blida, l'Arba, Palestro, Bouira, Bordj bou Arréridj, Sétif, Constantine, Guelma, Souk Ahras, and le Kef or Ghardimaou;
- (c) local interior roads such as those from Mascara through Tiaret to Affreville, and from Batna to Khenchela;
- (d) the north-south penetration roads, of which the following are the most important:

Oran-Tlemcen-el Aricha
 Oran-Sidi bel Abbès-Bedeau-el Aricha
 Oran-Mascara-le Kreider
 Mostaganem-Relizane-Tiaret-Aflou
 Ténès-Vialar-Chellala
 Algiers-Blida-Djelfa-Laghouat
 Algiers-Aumale-Bou Saada-Biskra
 Bougie-Maillot
 Bougie-Sétif-Batna
 Philippeville-Constantine-Batna-Biskra
 Constantine-Ain Beida-Tébessa
 Philippeville-Guelma

Bône–Guelma–Sédrata–Ain Beida
Bône–Souk Ahras–Tébessa
La Calle–Souk Ahras

Classification

The classification of the highway system conforms to that of France:

- (a) Routes Nationales (N.)
- (b) Chemins de Grande Communication (C.)
- (c) Chemins d'Intérêt Commun (I.C.)
- (d) Chemins Vicinaux Ordinaires (V.)

In addition to these there are the tracks or *pistes*, which cross the Sahara and the desert sections of the High Plateaux. Unlike the recognized roads, they are not distinguished individually by numbers.

The aggregate distance covered by Routes Nationales (N.) is about 4,200 miles, and by secondary roads (C., I.C., and V.) 25,500 miles. The former, which vary in width from 20 to 40 feet with narrower stretches in mountainous districts, generally have tarred surfaces: concrete is rarely used, although one section of the Algiers–Constantine road (N. 5) near Reghaia was thus paved before 1939. In the plains the Routes Nationales are broad, straight, and usually bordered by trees, sometimes with an earth track alongside. The tarmac at the edges is often jagged, terminating in soft, treacherous verges. In the mountains a sinuous but well-engineered course is invariably followed, with numerous hairpin bends, steeply banked and generally marked with white stones, posts, or painted oil-drums (Photo. 70). Full double-traffic width cannot always be depended upon, but there are numerous passing-places, and 5-ton lorries towing 3 to 5-ton trailers circulate freely in the Tell.

Coastal roads have in many cases been cut in the cliff side and these *corniches* are characterized by sharp corners and occasional tunnels with restricted width and headroom—about 12 feet in each case. These remarks also apply to the passages of gorges, particularly Chabet el Akra and Palestro.

Secondary roads, although narrow, are seldom less than 16 feet wide, and their surfaces, if not tarred, are metalled and well maintained.

Tracks, although rough, can normally be used by light motor transport or even omnibuses during dry weather. North of the Saharan Atlas, however, the winter and spring rains cause disintegration of their unmade surfaces, whilst oueds of running water, which are crossed by fords only, become impassable. Warning and direction

signs conforming to the International Code, supplemented by plaques obtained from Michelin and other firms, are found on classified roads, which are also equipped with kilometre stones; those along Routes Nationales have red painted tops.

Engineering

The topography of Algeria presents certain difficulties to motor transport because gorges and steep gradients are a common feature through the mountains. Many roads are very winding, and the highest parts of some of them through the mountains are often blocked by snow during the winter months.

In no instance do gradients on any classified road in Algeria exceed 1 in 8. The formidable Col de Tirourda in the Grande Kabylie seldom reaches this degree of steepness, the gradient being 1 in 10 or less on the major part of its ascent from both north and south.

Bridges are generally well built and are either of masonry and steel-girder work (Photos. 65, 69, 85), or of reinforced concrete of modern design (Photos. 64, 66, 86). On the other hand, many of them are narrow, particularly girder bridges, and the sign 'Pont Étroit' occurs continually, even on such important highways as that from Algiers to Laghouat (N. 1). Culverts are stoutly constructed, but neglect has in some cases caused stone blocks to become loose, and some might collapse under continuous heavy traffic.

Routes Nationales

The following is a list of the main Routes Nationales taken from the French Michelin map of 1939. They are shown on the map in the pocket at the end of the book.

- N. 1. Algiers-Blida-Djelfa-Laghouat
- N. 2. Oran-Tlemcen
- N. 3. Philippeville-Constantine-Batna-Biskra
- N. 4. Oran-Arzu-Mostaganem-Relizane-Orléansville-Affreville-Blida
- N. 4 A. Ste. Barbe du Tlélat-l'Hillil
- N. 5. Algiers-Ménerville-Bouira-Sétif-Constantine
- N. 6. Oran-Ste. Barbe du Tlélat-St. Denis du Sig-Mascara-le Kreider-Géryville
- N. 7. Oudjda-Tlemcen-Sidi bel Abbès-Mascara-Relizane
- N. 7 A. Nemours-Sidi bou Djenane
- N. 7^{et}. Port Say-Marnia
- N. 8. Algiers-Aumale-Bou Saada
- N. 9. Bougie-Sétif
- N. 10. Constantine-Ain Beida-Tébessa

- N. 11. Algiers–Cherchel–Ténès–Mostaganem
- N. 11 A. Bourkika–Desaix
- N. 12. Ménerville–Tizi Ouzou–Azazga–Bougie–Djidjelli–Philippeville–
Bône–le Tarf–la Calle
- N. 13. Arzeu–Ste. Barbe du Tlélat–Sidi bel Abbès–Bedeau–el Aricha
- N. 14. Mascara–Tiaret–Affreville
- N. 15. Tizi Ouzou–Fort National–Maillot
- N. 16. Souk Ahras–Tébessa
- N. 17. Perrégaux–Mostaganem
- N. 18. Affreville–Médéa–Berrouaghia–Bir Rabalou–Bouira
- N. 19. Ténès–Orléansville–Vialar
- N. 20. Constantine–Guelma–Bône
- N. 20 A. Guelma–Duvivier
- N. 21. Bône–Duvivier–Souk Ahras–Ghardimaou
- N. 22. Beni Saf–Tlemcen–Sebdou–el Aricha
- N. 23. Relizane–Zemmora–Tiaret–Aflou–Laghout
- N. 24. Maison Carrée–Ain Taya–Dellys–Port Gueydon
- N. 25. Dellys–Camp du Maréchal–Mirabeau–Dra el Mizane
- N. 26. El Kseur–Akbou–Maillot
- N. 27. El Milia–Constantine
- N. 28. Sétif–Colbert–Barika–MacMahon
- N. 29. Blida–l'Arba–Fondouk–Palestro
- N. 30. Dra el Mizane–Boghni–Michelet

Summary of Routes

For convenience of description the country has been divided into northern Algeria and the Saharan region. Northern Algeria extends approximately to the line of the Saharan Atlas. It has been subdivided to correspond roughly with the following coastal sections:

- Moroccan frontier to Oran
- Oran to Cherchel
- Cherchel to Bougie
- Bougie to Philippeville
- Philippeville to the Tunisian frontier.

The roads of the Saharan region are described on pp. 323–340.

MOROCCAN FRONTIER TO ORAN

Coastal Roads

Interior Roads

1. Oudjda–Tlemcen–Sidi bel Abbès–Oran
2. Tlemcen–Ain Témouchent–Oran
3. Tlemcen–Sebdou–el Aricha
4. Sidi bel Abbès–Télagh–Bedeau–el Aricha

ORAN TO CHERCHEL

Coastal Road

5. Oran-Ténès-Cherchel

*Local Coastal Roads**Interior Roads*

6. Ténès-Orléansville
7. Sidi bel Abbès-Mascara-Relizane-Affreville
8. Oran-St. Denis du Sig-Relizane
9. Mascara-Frenda-Tiaret-Affreville

*Roads of the Ouarsenis**Roads to the South*

10. Mascara-Saida-le Kreider-Géryville or Ain Sefra
11. Relizane-Tiaret-Aflou

CHERCHEL TO BOUGIE

Coastal Road

12. Cherchel-Algiers

*Local Coastal Roads**Interior Roads*

13. Affreville-Algiers-Beni Mansour-Sétif
14. Affreville-Berrouaghia-Bir Rabalou-Bouira
15. Algiers-Blida-Djelfa-Laghouat
16. Algiers-Bou Saada-Biskra

Roads of the Grande Kabylie

17. Algiers-Bougie
18. Mirabeau-Dra el Mizane
19. Tizi Ouzou-Maillot
20. Bougie-Maillot

BOUGIE TO PHILIPPEVILLE

Coastal Road

21. Bougie-Philippeville

Interior Roads

22. Bougie-Sétif
23. Djidjelli-Duquesne-Constantine
24. Collo-el Milia-Constantine
25. Philippeville-Constantine
26. Sétif-Constantine
27. Constantine-Batna-Biskra

Roads of the Aurès

PHILIPPEVILLE TO THE TUNISIAN FRONTIER

Coastal Road

28. Philippeville-Bône-Tabarka

*Local Coastal Roads**Interior Roads*

29. Constantine-Guelma-Souk Ahras-Ghardimaou or le Kef

30. Philippeville-Guelma

31. Bône-Guelma-Ain Beida-Khenchela

32. Constantine-Ain Beida-Tébessa

33. Bône-Duvivier-Souk Ahras-Tébessa

34. La Calle-Souk Ahras-Sédrata

MOROCCAN FRONTIER TO ORAN

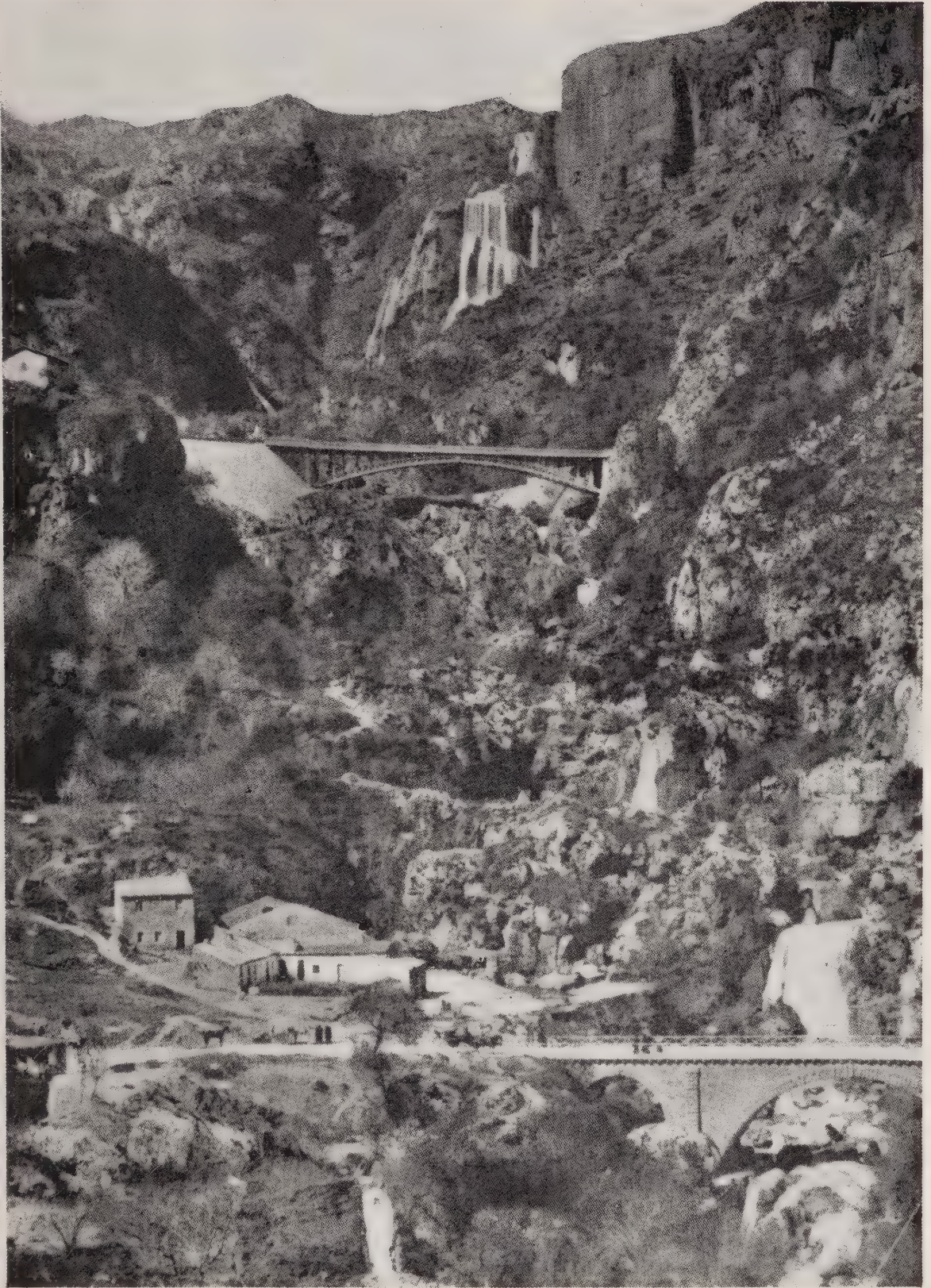
(FIG. 71)

Between the Moroccan frontier and Oran the highland approaches the coast and makes cross-country communication difficult. The Massif des Traras borders the coast as far as Beni Saf and is separated from the parallel Monts de Tlemcen by the valley of the Oued Tafna. The line of highlands is continued north-east of Tlemcen by the Monts du Tessala. Between the latter and the coast south-west of Oran, the Sebkhah d'Oran forms another obstacle to communications. South of the Monts de Tlemcen and the Monts du Tessala are the open regions of the High Plateaux.

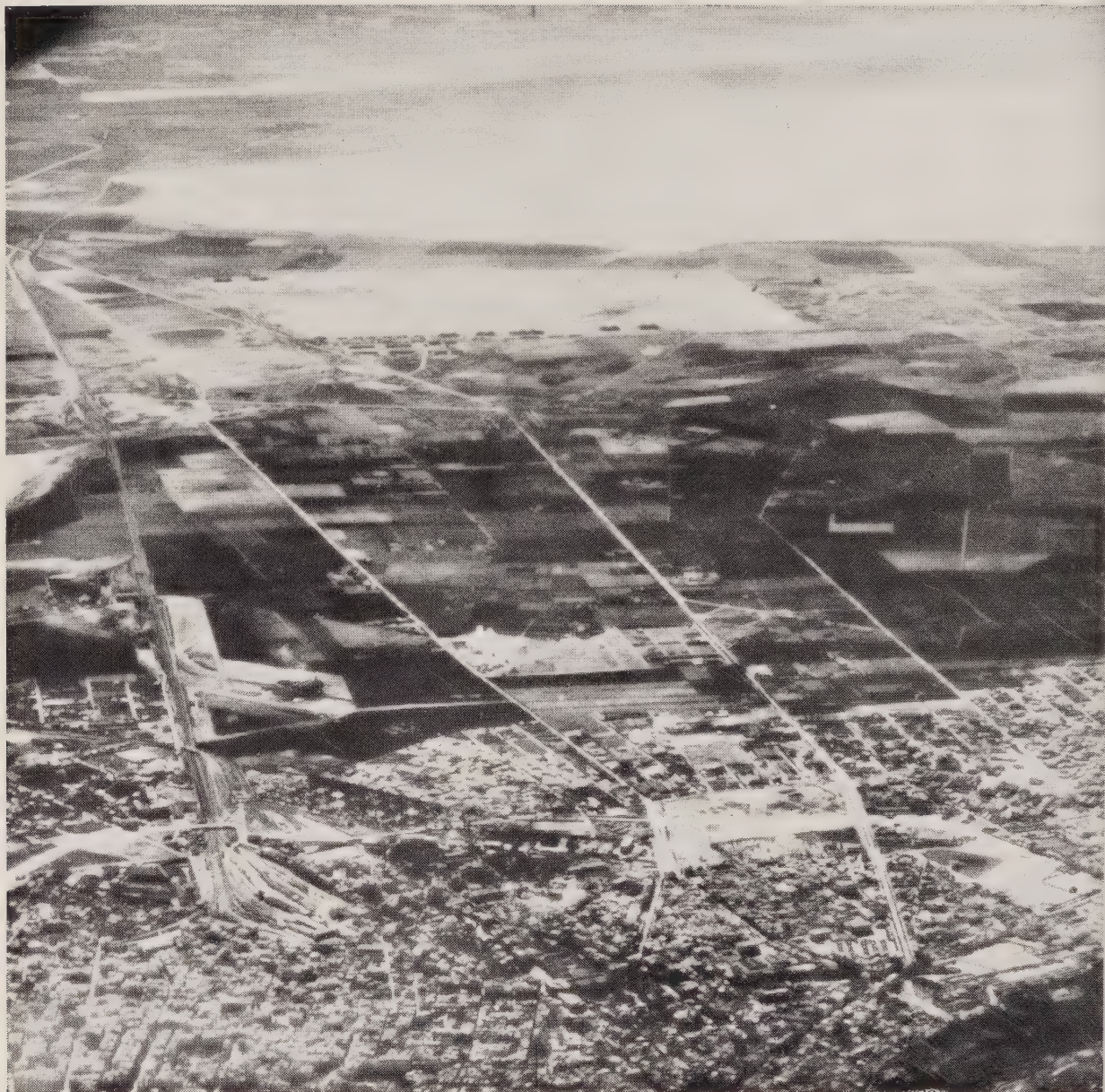
Despite the natural features there is, in the north, a network of roads which for Algeria is fairly dense. The main element is a west-east central highway from Oudjda to Tlemcen and Sidi bel Abbès, which follows the depression between the Traras and the Tlemcen mountains by the Mékerra-Sig valley. This is the only route westward into Morocco, where it is continued through the Taza gap to the Atlantic seaboard. In Algeria it is linked to Oran by two great branches north and south of the Monts du Tessala—Tlemcen-Ain Témouchent-Oran and Tlemcen-Sidi bel Abbès-Oran—and forms with its northern branch the collector for all the roads leading inland from the ports and coast. Two main routes lead southward from Tlemcen and Sidi bel Abbès to the route centres of the High Plateaux.

Coastal Roads

Because of the nearness of the highland to the coast in this western section there is no continuous coastal road. There are only two



62. *Road and railway bridges in el Ourit gorge, near Tlemcen (N.7)*



63. *Oran: roads and railways leading south-west towards the Sebkhah d'Oran*

good roads leading inland between the Moroccan frontier and Beni Saf on account of the high cliffs and the difficulty of access to the interior. Between Beni Saf and Oran the country is easy and routes are numerous. The main ports are Port Say, Nemours, and Beni Saf, and these are all connected with the interior by good main roads. From Port Say a road (N. 7^{et}) follows the valley of the Oued Kiss and then crosses the western end of the Massif des Traras, to reach the main Oudjda-Tlemcen road 3 miles (5 km.) west of Marnia. From Nemours roads lead to the Port Say-Marnia road, and by Nedroma direct to Marnia. Beni Saf is connected with Tlemcen by a good road (N. 22) which uses the valley of the Oued Tafna to cross the highland, and is also linked with Ain Témouchent (C. 10). Numerous secondary roads connect the northern main road with the coast all the way from Ain Témouchent to Oran. From Bou Tlélis on this road, 18 miles (29 km.) from Oran, a secondary road leads round Djebel Murdjadjo to les Andalouses and Cap Falcon, and continues close along the coast through Mers el Kebir to Oran.

Interior Roads

1. OUDJDA—TLEMCEEN—SIDI BEL ABBÈS—ORAN. N. 7, N. 13, N. 6.
158 miles (254 km.)

This is the western part of the main inland trunk road, and the only main road connecting with French Morocco. From Oudjda the road runs north-eastward across the Marnia plain to Marnia, and then winds through forested country, crossing the Oueds Tafna and Zitoun by steel and masonry bridges built high above the river. It follows the northern edge of the Monts de Tlemcen to Tlemcen (50 miles, 80 km.), where it descends (N. 13) into the valley of the Oued Safsaf and makes a big hairpin bend to cross the river in the gorge of el Ourit by a three-span, solid masonry bridge (54 miles, 87 km.) (Photo. 62). From here the road is winding and undulating until it reaches the well-cultivated Bel Abbès plain, which it crosses to Sidi bel Abbès (106 miles, 171 km.). Beyond the town the road continues across the plain, and then rises over the eastern end of the Monts du Tessala, turning northward to Ste. Barbe du Tlélat (140 miles, 226 km.), where it joins the main Oran-Algiers road (N. 6). This passes round the eastern shore of the Sebkha d'Oran and enters Oran (158 miles, 254 km.) (Photo. 63).

2. TLEMCEEN—AIN TÉMOUCHENT—ORAN. N. 2. 86 miles (138 km.)

This is an alternative to the road between Tlemcen and Oran

described above. It is a wide main road running north-eastward across the *Monts du Tessala*. After crossing the *Oued Isser* it rises steeply to the *Col d'en Krilat* (1,995 ft.), 29 miles (46 km.) from *Tlemcen*. From here there is a winding but gradual descent through *Ain Témouchent* (41 miles, 66 km.) to the coastal plain, and along the northern shore of the *Sebkha d'Oran* to *Oran* (86 miles, 138 km.).

3. *TLEMCEN-SEBDOU-EL ARICHA*. N. 22. 54 miles (86 km.)

This is a main road leading southward from the *Oudjda-Oran* road. It crosses the forested slopes of the *Monts de Tlemcen*, winding to a height of more than 3,900 feet; it then descends to cross the *Oued Mefrouch*, the upper course of the *Oued Safsaf* (7½ miles, 12 km.), and passes through forests of cork and holm oak and through gorges between cliffs of dolomite 490 feet high. It rises to the *Col de Tatterni* (4,757 ft.) and then crosses a stony plain, descending to *Sebdou* (24 miles, 38 km.; 3,051 ft.). From here to *el Aricha* the road crosses an alfa steppe region, rising to 4,110 feet at *el Aricha* (54 miles, 86 km.).

4. *SIDI BEL ABBÈS-TÉLAGH-BEDEAU-EL ARICHA*. N. 13. 91 miles (147 km.)

This road runs directly southward from *Sidi bel Abbès* across open country to *Bossuet* (41 miles, 65 km.), rising to 4,180 feet. It then descends with a zigzag course to *Bedeau* (58 miles, 98 km.), and continues across the alfa-covered plateau to *el Aricha* (91 miles, 147 km.), where numerous routes radiate to other centres of the *High Plateaux*. There is an alternative, but much poorer, road from *Sidi bel Abbès* to *Bedeau*, leaving the main road west of the town and running through forested country via *Chanzy* and *Magenta* (C. 39).

ORAN TO CHERCHEL

(FIG. 71)

East of *Oran* beyond the *Macta* marshes the *Dahra* massif is sufficiently high and difficult of access to make the road network thin out considerably. On its southern side the *Chélif* valley forms an admirable natural routeway across the country and is followed by the main inland highway between *Oran* and *Algiers*. South of the plains of the *Sig*, *Habra*, and *Chélif* lie the *Monts des Beni Chougran*, followed eastward by the *Ouarsenis* massif, and to the south again

rise the Monts de Daia, Saida, and Frenda, which form the northern edge of the High Plateaux. The region is, therefore, a somewhat complex area of highland and plain, and communications are limited in the eastern part of the section, though in the western part the road network is comparatively dense and the pattern less definite. This is due to the fact that there are three, instead of two, lateral routes

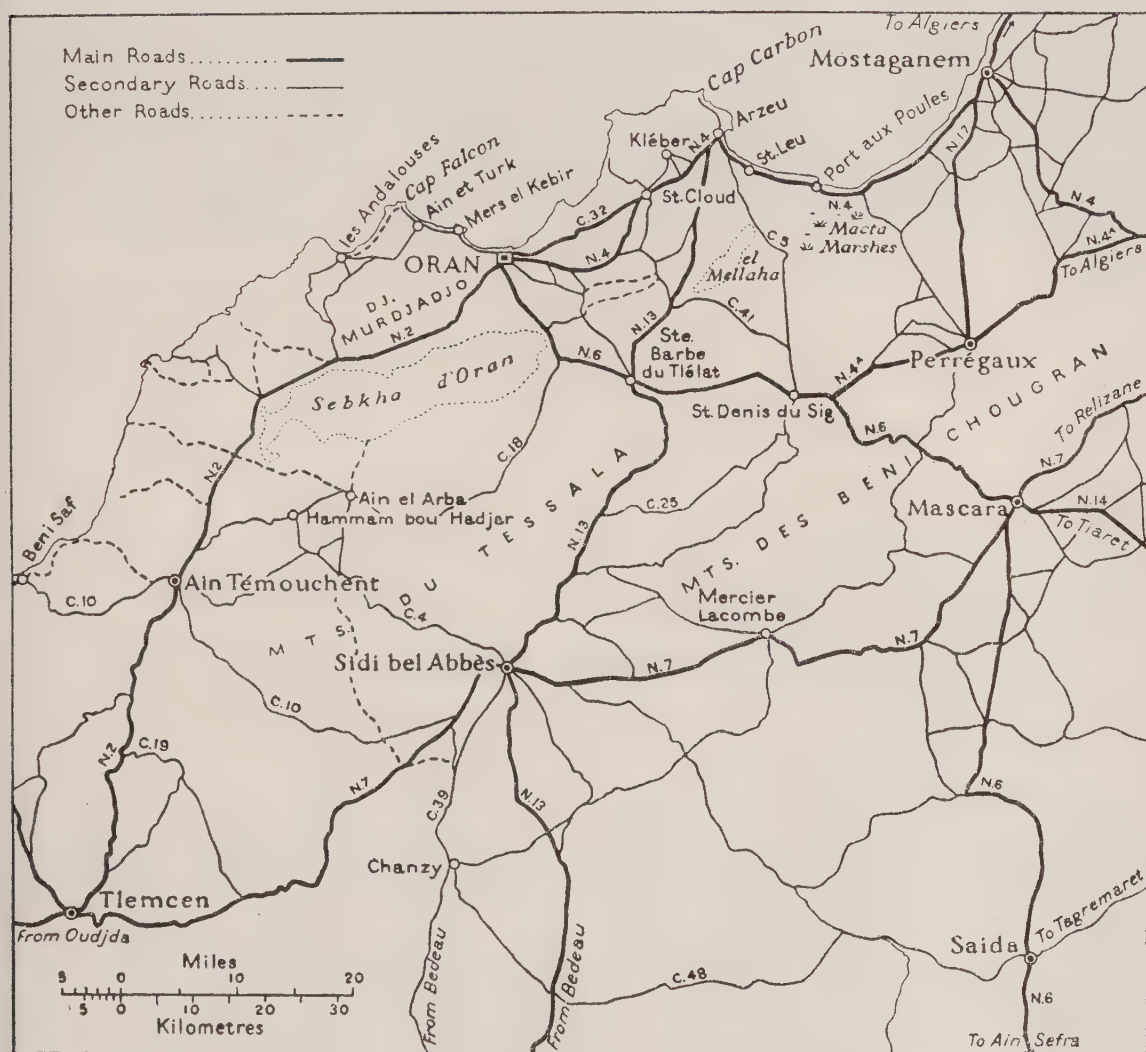


FIG. 71. The roads of the Oran district

following the main grain of the country from west to east, with transverse north-south links between them. In the north there is a continuous coastal road. South of this the main inland highway from Sidi bel Abbès through Mascara to Relizane in the Chélif valley is duplicated by the route linking Sidi bel Abbès, Oran, and Relizane. East of Relizane a great road encircles the core of the Ouarsenis and returns to the main central highway at Affreville. Transverse north-south routes link the ports on the coastal road, Oran, Arzeu, Mostaganem, and Ténès, to the inland centres on the lateral routes, i.e. to

Mascara, Relizane, Orléansville, and Affreville on the main central highway, and to Saida, Frenda, and Tiaret on the southern flank of the Ouarsenis. These latter are linked in turn across the High Plateaux to the focal centres of the Saharan Atlas, Ain Sefra, Géryville, and Aflou.

Coastal Road

5. ORAN-TÉNÈS-CHERCHEL. N. 4, N. 11. 219 miles (351 km.)

From Oran this road leads north-eastward to the port of Arzeu (27 miles, 43 km.). There is an alternative road between Oran and St. Cloud (C. 32). Beyond Arzeu the main road continues round the Golfe d'Arzeu to Mostaganem (50 miles, 80 km.). From Cap Kramis to Ténès, and in parts beyond, it is a corniche road, cut into the cliff side and in places tunnelled through the rock. There are several narrow sections and blind corners, and some of the many bridges are limited in the weight that they can carry. Most of the bridges are of masonry, concrete, or steel (Photo. 64), and the largest, that over the Oued Chélif at 61 miles (98 km.), just north of Mostaganem, is a steel girder bridge of three spans with masonry piers, and nearly 160 yards long (Photo. 65).

At 145 miles (234 km.) the road crosses the Oued el Amri by a reinforced-concrete viaduct of eight arches of 45 feet span and about 100 feet high (Photo. 67). The road continues from Ténès (151 miles, 242 km.) to Cherchel (219 miles, 351 km.) and follows the coastline closely except where it runs inland to avoid highland masses such as that of Cap Ténès, east of Ténès. The road maintains its corniche character for much of the distance between Ténès and Cherchel, and is hilly and winding throughout with many sharp ascents and descents to oueds and ravines. Between Ténès and Cherchel in particular the road is not suitable for heavy traffic and is very vulnerable from the sea. The well-wooded Dahra massif rises steeply inland from the road.

Local Coastal Roads

Important junctions along the coastal road are the ports of Arzeu, Mostaganem, and Ténès. In the western part of the section there are numerous roads running between this road and the Oran-Affreville road, and the network is complicated. The region of the Macta marshes is an exception, being crossed by only one good road from Arzeu to St. Denis du Sig (C. 5). Another road (N. 13) runs inland



64. *Steel and concrete bridge over Oued Kramis between Mostaganem and Ténès (N. II)*



65. *Steel girder bridge with masonry piers over Oued Chélif, north of Mostaganem (N. II)*



66. *Road bridge over Oued Mina between Palat and Tiaret (N. 14)*



67. *Viaduct over Oued el Amri, west of Ténès (N. 11)*

from Arzeu to Ste. Barbe du Tlélat (24 miles, 38 km.). Numerous roads radiate from Mostaganem, the chief roads leading south-west to Perrégaux (25 miles, 40 km.; N. 17) and south-east to Relizane (36 miles, 58 km.; N. 4). Between the Ténès-Orléansville road and Cherchel the Dahra is crossed only by a poor secondary road.

Interior Roads

6. TÉNÈS-ORLÉANSVILLE. N. 19. 33 miles (53 km.)

This is the most important road across the Dahra massif. It follows the valley of the Oued Allalah at first, passing through picturesque gorges, and then rises to the Col de Kirba (1,485 ft.) in 14 miles with a very winding course. At les Heumis the road joins the valley of the Oued Ouahrane, where there is a masonry bridge over the river, and then follows the valley closely to Warnier. For the last $2\frac{1}{2}$ miles (4 km.) before reaching Orléansville the road passes through cultivated land, and just before entering the town it crosses the Oued Chélif by a steel girder bridge.

7. SIDI BEL ABBÈS-MASCARA-RELIZANE-AFFREVILLE. N. 7, N. 4. 204 miles (329 km.)

From Sidi bel Abbès the well-cultivated and more or less level plain of Bel Abbès is crossed to Mercier Lacombe, whence the road continues to the valley of the Oued el Hammam at Trois Rivières; it crosses just below the junction of the three rivers which unite to form the Hammam. Next it turns the southern slopes of the Monts des Beni Chougran and follows the right bank of the Oued Fekan to Tizi, whence the Eghris plain is crossed to Mascara (55 miles, 89 km.). From Mascara to Relizane the road is undulating and winding: it rises from Mascara on to the plateau between Mascara and Relizane at an average height of about 2,000 feet. Just before reaching Tliouanet (82 miles, 132 km.) there is a series of hairpin bends by which the road descends to the narrow Khourara plain and Relizane (95 miles, 154 km.). Thence it follows the plain of the Chélif at some distance from the left bank of the river, and close to the northern edge of the Ouarsenis, all the way to Orléansville (150 miles, 242 km.). About 30 miles beyond Orléansville the road bears southward away from the river for some miles, crossing a low spur of highland and the tributary Oued Fodda. The Chélif, meanwhile, winds into the highland, passing through a gorge, before returning to the plain. It is crossed 11 miles before reaching Affreville.

This is an excellent main road. There are numerous bridges across the main rivers and their tributaries: all are masonry or concrete and steel girder, and are capable of taking heavy traffic.

8. ORAN-ST. DENIS DU SIG-RELIZANE. N. 6, N. 4 A. 83 miles (133 km.)

This road, linking with the Sidi bel Abbès-Oran road, forms the northern branch of the central trunk route between Sidi bel Abbès and Relizane. The road crosses the level plains of the Sig and Habra, passing through St. Denis du Sig (33 miles, 53 km.), to reach the Chélif plain beyond Relizane. There are long bridges over the Oueds Habra and Mina.

9. MASCARA-FREND A-TIARET-AFFREVILLE. N. 14. 203 miles (327 km.)

This road from Mascara to the south-east crosses the Monts de Saida to Frenda (3,400 ft.) by the Col de Guergour (2,460 ft.); it then swings north-east to Palat (3,115 ft.) and descends to the valley of the Oued Mina (Photo. 66). It rises again to Tiaret (96 miles, 155 km.; 3,609 ft.), which lies at the western end of the plateau of Sersou and is the main centre and road junction of the region.

From Tiaret the road crosses the northern edge of the plateau of Sersou, mainly through grazing land, past Vialar to Teniet el Had (167 miles, 269 km.; 3,773 ft.) with numerous hairpin bends and steep gradients. Between Teniet el Had and Affreville the road crosses the eastern end of the Ouarsenis and drops almost continuously down to 1,025 feet at Affreville in the Chélif valley. The mountains are forested with cedars and Aleppo pine; the roads may be blocked by snow in February.

Roads of the Ouarsenis

The Ouarsenis massif, encircled by the routes described above (7, 9), is also crossed by two major routes from Relizane to Tiaret (N. 23) and from Orléansville to Vialar (N. 19). The latter is a mountainous road, mainly through pine and evergreen-oak forest, leading from the Chélif valley to Vialar (71 miles, 113 km.) on the plateau of Sersou at the edge of the High Plateaux.

Teniet el Had is a minor route centre on N. 14: a narrow road runs west through the Ouarsenis to Molière on the Orléansville-Vialar road and a secondary road east to Boghari on the Blida-Djelfa road.

The road to Boghari follows a winding course through the foothills of the Ouarsenis, passing through Letourneux and Boghar.

Roads to the South

10. MASCARA-SAIDA-LE KREIDER. N. 6. 95 miles (153 km.)

The road running directly southward from Mascara is one of the main penetration lines into the desert, and is the beginning of the great highway to Colomb Béchar and thence across French West Africa to the Niger (p. 329). From Mascara it runs directly south to the High Plateaux, and from there to the northern edge of the Saharan Atlas. It is in general a good road. It follows a winding course between the Monts de Daia and Saida, rising until it reaches Saida (45 miles, 73 km.; 2,746 ft.). Beyond Saida the road climbs to a height of over 3,350 feet through wooded highland, and then continues across the plateau, where alfa is dominant. The country becomes more monotonous and the road descends gradually to le Kreider (95 miles, 153 km.).

Le Kreider-Géryville. Beyond le Kreider the road (N. 6) branches left to Géryville (168 miles, 271 km.), from which numerous tracks lead east, south, and west to other centres of the Saharan Atlas.

Le Kreider-Ain Sefra. The main road to Ain Sefra (213 miles, 343 km.) continues south-west from le Kreider, following the line of the railway. Its course is generally level. It passes between Djebel Moghad on the west and Djebel Aissa on the east shortly before reaching Ain Sefra, beyond which the route continues as the Tanezrouft route across the Sahara (p. 329).

11. RELIZANE-TIARET-AFLOU. N. 23. 166 miles (268 km.)

This road, of less importance than the Mascara-Ain Sefra road, is a secondary route of penetration across the High Plateaux to the Djebel Amour section of the Saharan Atlas. It crosses the western end of the Ouarsenis to Tiaret (59 miles, 95 km.), climbing most of the way. From there it rises again to the plateau of Sersou, and after an undulating course through cultivated land crosses the wooded highland of Djebel Nador and reaches the alfa steppe region which extends to the foot of Djebel Amour. Beyond Aflou the road continues to Laghouat (243 miles, 391 km.) on the road from Algiers to Ghardaia.

Chellala (Reibell), a native village of the High Plateaux south-east of Tiaret, is a route centre of local importance between the Tiaret-Aflou and the Algiers-Laghouat roads.

CHERCHEL TO BOUGIE

(FIG. 72)

Between the Chélif valley and the Soummam depression the easy west-east inland line of communication is interrupted by the Blida Atlas and the Tablat massif, and by the plateau of Médéa to the south of them. These cut off the plain of the Mitidja around Algiers from the interior. The main inland highway makes a detour northward to Algiers across these mountains by difficult routes, though a more direct link crosses the Médéa plateau from the Chélif valley to the Soummam depression. Two great north-south roads to the Saharan centres of Djelfa and Biskra take their departure from the route across the Médéa plateau; they are also linked to Algiers across the Blida Atlas and the Tablat massif. Thus the general pattern of west-east roads crossed by north-south routes is modified by the centripetal influence of Algiers. All the major routes of this section are linked to Algiers by roads which break through the rim of mountains edging the Mitidja by difficult passes, such as the spectacular gorge of the Oued Chiffa (N. 1) (Photo. 73; Vol. I, Fig. 13) and the Palestro gorge (N. 5) (Photos. 68, 69, 71). From Algiers main routes fan out in all directions and provide the Mitidja with a dense network.

The region east of the Mitidja between Algiers and Bougie consists mainly of highland bordering the coast. The great mass of the Grande Kabylie, reaching its highest summits in the southern part (Djebel Djurdjura), does not form so marked an obstacle to communications as might be supposed, because it is cut by numerous rivers, the valleys of which form natural routes. Immediately to the east and south-east of the Grande Kabylie the great trough of the Oued Soummam forms the eastern end of the Oran-Bougie depression, and provides a good natural routeway round the southern and eastern sides of the Kabylie massif; on the western side, the Oued Isser cuts through the edge of the highland by the Palestro gorge, and is a natural, though difficult, line of communication between the Mitidja and the Soummam valley. The Grande Kabylie is skirted to the south by roads using these routes—the main road from Algiers to Constantine as far as Maillot, and the Maillot-Bougie road—and the direct route from Algiers to Bougie crosses the northern part of the highland, following the valley of the Oued Sebaou. Transverse routes cross the massif from north to south by tributary valleys.

There is no continuous coast road east of Algiers, but the main



68. *Embanked road through Palestro gorge (N. 5)*



69. *Bridge over Oued Isser, Palestro gorge (N. 5)*



70. Road marked by painted oil-drums between Boghari and Djelfa (N. 1)



71. Road entering rock tunnel in Palestro gorge (N. 5)

road from Algiers to Bougie serves to link the small ports by branch routes. The road network is well developed in the northern part of this section, especially near Algiers and Bougie. Along the interior highway and its southern alternative, the major route-centres are Blida, Ménerville, Médéa, Bir Rabalou, and Maillot. Tizi Ouzou is the focal point of the Grande Kabylie, and Djelfa and Bou Saada the centres of the Saharan Atlas.

Coastal Road

12. CHERCHEL-ALGIERS. N. 11. 60 miles (97 km.)

The main Oran-Algiers coastal road continues from Cherchel to Algiers. Between Cherchel and Tipaza it turns inland to circumvent the rugged Djebel Chenoua. From Tipaza to Algiers it follows the coast closely, often through vineyards: between Castiglione and Algiers the land rises fairly steeply at first and then more gradually to the ridge of the Sahel, from which it drops sharply down to the plain of the Mitidja. Consequently the roads leading down from this high belt are steep and winding.

Local Coastal Roads

The coastal road from Algiers to Port Gueydon (N. 24) is very indifferent as far as Dellys, and second-class between Dellys and Port Gueydon. Both Dellys and Port Gueydon are linked by second-class roads southward to the main Algiers-Bougie road along the Sebaou valley. There is only a poor road to the east of Port Gueydon. From Cap Sigli to Bougie there is a narrow coastal road.

Interior Roads

13. AFFREVILLE-ALGIERS-SÉTIF. N. 4, N. 1, N. 5. 280 miles (448 km.)

From Affreville the main interior road turns north to cross the Massif de Miliana, which forms the eastern end of the Dahra. Between Affreville and Bourkika the road rises to 2,500 feet with maximum gradients of between 1 in 13 and 1 in 8. There are frequent hairpin bends in the first 30 miles, and care is needed on the descent owing to sharp turns. In the first $5\frac{1}{2}$ miles the road climbs 1,350 feet, winding through orchards to Miliana, which overlooks the Chélif plain. At Bourkika the road turns sharply to the east and follows the southern edge of the Mitidja to Blida, and then crosses the plain through Boufarik and Birtouta to Algiers (87 miles, 140 km.; N. 1).

Beyond Algiers the road (now N. 5) runs eastward across the

Mitidja to l'Alma, where it begins to wind and rise with gradients of 1 in 15. Just east of Ménerville (122 miles, 197 km.) it turns southward to Palestro, following the valley of the Oued Isser. It passes through the Palestro gorges for $8\frac{1}{2}$ miles (14 km.) where road, railway, and river are parallel. The bridges are of masonry or concrete and there is much masonry embankment work in the gorges, with natural and artificial tunnels (Photos. 68, 69, 71). The tunnels have restricted headroom, although buses use the route. Falls of rock are frequent in the spring; parapets guard many of the precipices. From Palestro the road climbs 1,115 feet in 12 miles (20 km.) to the Col de Dra, descending again to Bouira (164 miles, 264 km.), the centre of a cereal-, vine-, and olive-growing district. Beyond Bouira it follows the southern side of Djebel Djurdjura, reaching the valley of the Oued Sahel. At Beni Mansour it turns south and crosses the barren region of the Biban chain by the Portes de Fer (Photo. 115). Here road, railway, and river are again parallel, and the road is narrower. The road turns eastward at Mansoura and, with numerous sharp bends, climbs steeply over the Col du Teniet el Merdja (3,225 ft.), passing over the railway tunnel. From Bordj bou Arréridj (239 miles, 383 km.) the road crosses the high Medjana plain and then follows an undulating course to Sétif (280 miles, 448 km.).

14. AFFREVILLE-BERROUAGHIA-BIR RABALOU-BOUIRA. N. 18. 126 miles (202 km.)

This road forms a direct link between the main Oran-Algiers trunk road (N. 4) and the main Algiers-Constantine road (N. 5), avoiding Algiers itself. It crosses the Médéa plateau south of the Blida Atlas, and reaches the high plains of Beni Slimane east of Berrouaghia and the Arib plain at Bir Rabalou. There are numerous bridges on this route, but none of any great size or difficulty, and on the whole the road is fairly easy. From Affreville it follows the upper Chélif valley, running along the southern edge of Djebel Gontas, a mile or two north of the river. At Lavigerie the road crosses the river, and again at Dollfusville (24 miles, 39 km.), where it turns north-eastward to Médéa (39 miles, 62 km.), rising with steep gradients by way of the valley of the Oued el Arbil to the plateau of Médéa. At Médéa it joins the main road from Algiers to Laghouat (N. 1), which it follows to Berrouaghia (59 miles, 94 km.; 3,025 ft.). At first the road winds down to the upper Isser valley, which it crosses at Souk el Khemis. From here it crosses the Beni Slimane plain and then the Arib plain to Bir Rabalou (104 miles, 167 km.): these are



72. By-road off the Algiers-Bougie road



73. Road and railway in the Chiffa gorge (N. I)



74. *Road over the Col des Caravanes between Boghari and Djelfa (N. 1)*



75. *Road between Aumale and Sidi Aissa (N. 8)*

open and somewhat desolate regions. At Bir Rabalou it crosses N. 8, and after Ain Bessem has a winding and undulating course to Bouira (126 miles, 202 km.; 1,696 ft.).

15. ALGIERS-BLIDA-DJELFA-LAGHOUAT. N. 1. 268 miles (432 km.)

The most important north-south road of this section is the road leading southward from Algiers through Blida and Boghari to Djelfa,

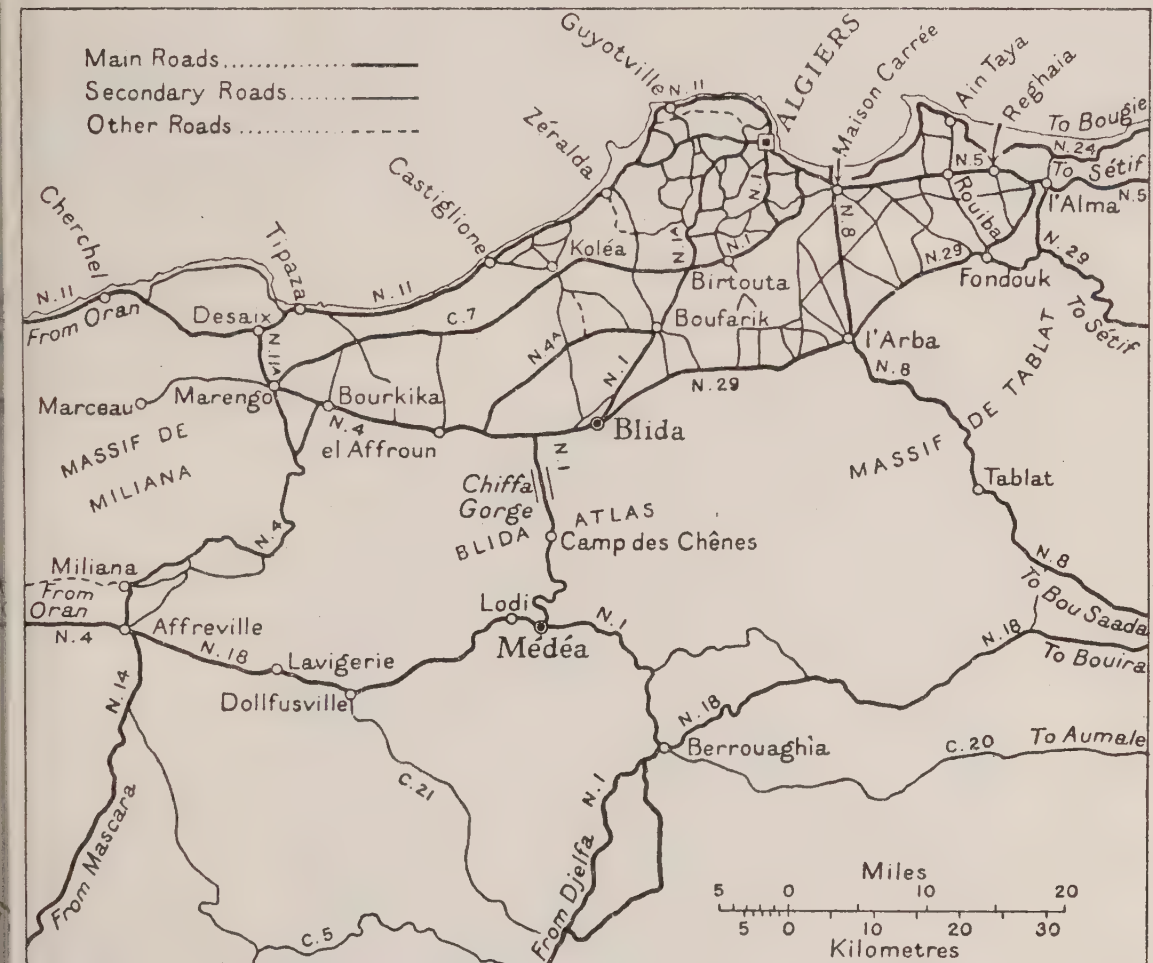


FIG. 72. *The roads of the Algiers district*

Laghouat, and Ghardaia. It is a first-class road to Laghouat, with a good surface. The same route is followed by the railway to Djelfa, and there are numerous bridges and level crossings. The only narrow section is that between Blida and Médéa, where the road crosses the Blida Atlas by the Chiffa gorge and runs 'en corniche' alongside the railway.

From Algiers to Blida (31 miles, 49 km.) the road is undulating as far as Birtouta and then level across the Mitidja, passing through rich, cultivated country. Just beyond Blida the road turns southward and follows the narrow valley of the Oued Chiffa across the

Blida Atlas. The gorge is very narrow and extends for $5\frac{1}{2}$ miles (9 km.) to Camp des Chênes (43 miles, 69 km.) (Photos. 73, 111; Vol. I, Fig. 13). The road continues to rise with a very sinuous course and many well-banked corners to Médéa (57 miles, 91 km.), which stands at about 3,000 feet at the foot of slopes clad with vines and fruit-trees; in the winter the road is sometimes blocked with snow near Médéa. There are gradients of 1 in 14 and 1 in 8. The country is undulating southward to Boghari (104 miles, 167 km.): on the hill-sides there are vineyards, but the summits are bare. It continues across a rather barren plateau, intersected by numerous watercourses, frequently dry, and with barren hills rising from the valleys (Photo. 70). Later it crosses the Seba Rous—the high ground separating the salt lakes Zahrez Gharbi and Zahrez Chergui—by a small defile, and continues over a pine-covered plateau and through the valley of the Oued Melah to Djelfa (199 miles, 320 km.; 3,600 ft.). From Djelfa to Laghouat the route is easy through desert country. Shortly after leaving Djelfa the road ascends the Col des Caravanes (4,134 ft.) and then descends gently to Ain el Ibel (224 miles, 358 km.) (Photo. 74). Beyond this point there are many dips in the road. The road descends to Laghouat (268 miles, 432 km.; 2,470 ft.): just before entering the town there is a long steel bridge (1,312 ft.) over the Oued Mzi. From Laghouat there is a motorable desert track to the south, known as the Ahaggar or Hoggar route (p. 332).

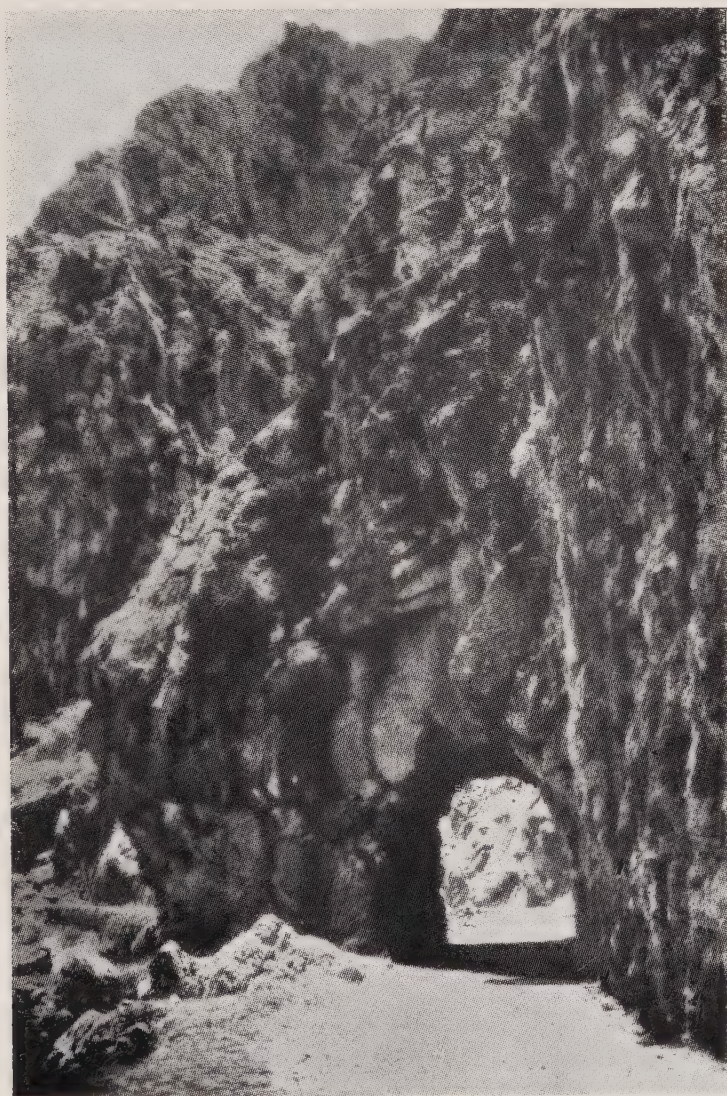
16. ALGIERS—BOU SAADA—BISKRA. N. 8, V. 1. 273 miles (437 km.)

This road crosses the Massif de Tablat and runs south-eastward from Algiers to Bou Saada and Biskra. From Algiers it turns southward at Maison Carrée and crosses the Mitidja to l'Arba. From here the road climbs and winds into the mountains to the Col des Deux Bassins (3,018 ft.), and then descends with a very winding course to Tablat and Bir Rabalou (65 miles, 104 km.), an important route-centre of the Arib plain. Roads run westward from Bir Rabalou to Berrouaghia (45 miles, 73 km.) and eastward to Bouira (22 miles, 35 km.) on the main Algiers—Constantine road.

From Bir Rabalou the road continues to Aumale ($77\frac{1}{2}$ miles, 124 km.; 2,900 ft.), and then rises to the Col de Dira (3,380 ft.) in the Monts du Titteri (Photo. 75), descending again to Sidi Aissa. It then crosses the barren desert country of the High Plateaux to Bou Saada (155 miles, 249 km.; 1,900 ft.), which lies in the south-west corner of the Hodna plain at the foot of the Saharan Atlas. Beyond Bou Saada the road becomes much more rough and stony, and the surface



76. *Fort National between Tizi Ouzou and Maillot (N. 15)*



77. *Road passing through rock tunnel on the Col de Tirourda (N. 15)*



78. Corniche road between Bougie and Djidjelli
(N. 12)



79. Rock tunnel on coastal road at les Falaises,
east of Souk et Tnine (N. 12)

is loose. Many oued beds are crossed, but there are no bridges and nearly all the oueds have steep banks. High clearance is essential for motor traffic. The road rises for the first 28 miles (45 km.) beyond Bou Saada, with many sharp corners and sudden dips, and then crosses a desolate plain to the Monts du Zab, which it crosses at about 3,000 feet. Shortly after this it enters hilly country and is undulating to Biskra (273 miles, 437 km.), where it joins the Ajers route across the Sahara (p. 338).

Roads of the Grande Kabylie

17. ALGIERS-BOUGIE. N. 5, N. 12. 147 miles (237 km.)

The main route between Algiers and Bougie crosses the northern part of the Grande Kabylie, which is well forested, though less mountainous than Djebel Djurdjura in the south. The country is picturesque, and the forests are mainly cork oak. This road leaves N. 5 just east of Ménerville and soon crosses the Oued Isser by a stone bridge. It is winding and undulating to Camp du Maréchal (54 miles, 86 km.) in the valley of the Oued Sebaou. It continues to follow the left bank of this river except for a short distance where the river is in a very narrow, enclosed valley between Djebel Aissa Mimoun and Djebel Beloua. For this section the road turns southward through Tizi Ouzou (65 miles, 104 km.). From here to Bougie the road is very hilly and winding; several narrow branch-roads lead into the mountains on either side (Photo. 72). At el Kseur (132 miles, 211 km.) it enters the Soummam valley and joins the main road linking Bougie with the Algiers-Constantine road. It continues to Bougie (147 miles, 237 km.), following the left bank of the river.

18. MIRABEAU-DRA EL MIZANE. N. 25. 20 miles (32 km.)

From Mirabeau a road crosses the highland to the south, following the valley of the Oued bou Gdoura, and descends again to Dra el Mizane, a small town in the valley which lies to the north of Djebel Djurdjura.

19. TIZI OUZOU-MAILLOT. N. 15. 65 miles (104 km.)

Another road of the Grande Kabylie leads southward from a point $4\frac{1}{2}$ miles (7 km.) east of Tizi Ouzou through Fort National, Michelet, and the Col de Tirourda to Maillot. This road climbs steeply with many bends and gradients of 1 in 12 and 1 in 10. It follows the ridge of highland known as Ait Iraten, rising about 2,800 feet in 11 miles, and avoiding the villages. The citadel of Fort National (17 miles, 27 km.) stands at about 3,020 feet (Photo. 76). The road continues

to Michelet and goes on rising steeply to the head of the Col de Tirourda (38 miles, 61 km.), and then descends southward (Photo. 77). There are many hairpin bends and steep gradients. On the north side of the col (5,774 ft.) there are gradients steeper than 1 in 10, and the pass is generally closed by snow from mid-November to mid-April. The road descends by the valley of a tributary to the Oued Sahel, and joins N. 26 $5\frac{1}{2}$ miles (9 km.) east of Maillot station. Several branch-roads lead east and west into the mountains and are generally hilly and narrow.

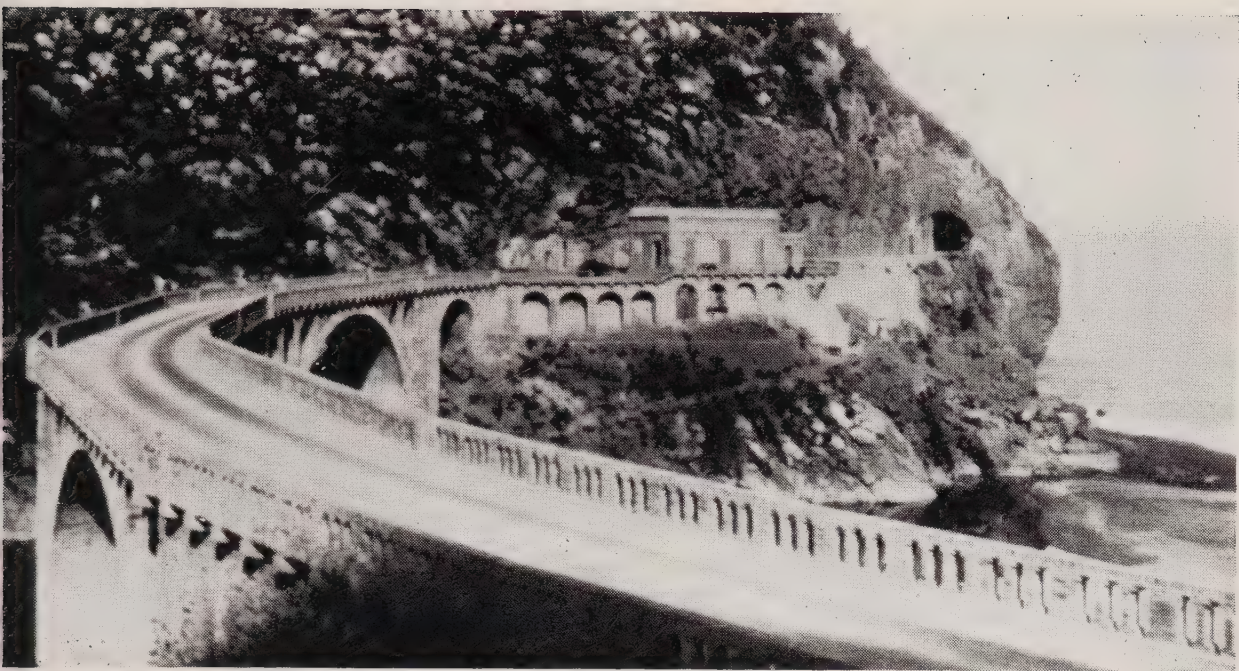
20. BOUGIE-MAILLOT. N. 26. 63 miles (101 km.)

This road is the only natural route inland from Bougie. It follows the valley of the Oued Soummam, which separates the Grande Kabylie from the Kabylie des Babors. The valley is also followed by the railway. The road rises gradually all the way from Bougie, and the course of the Oued Soummam is followed throughout. As far as Akbou (40 miles, 65 km.) the valley is deep and generally wide, except for a short narrow section near Sidi Aich. Beyond Akbou the road climbs steadily to Maillot station (63 miles, 101 km.), where it joins the main Algiers-Constantine highway. About $5\frac{1}{2}$ miles east of Maillot it is joined by the road from Tizi Ouzou across the Grande Kabylie.

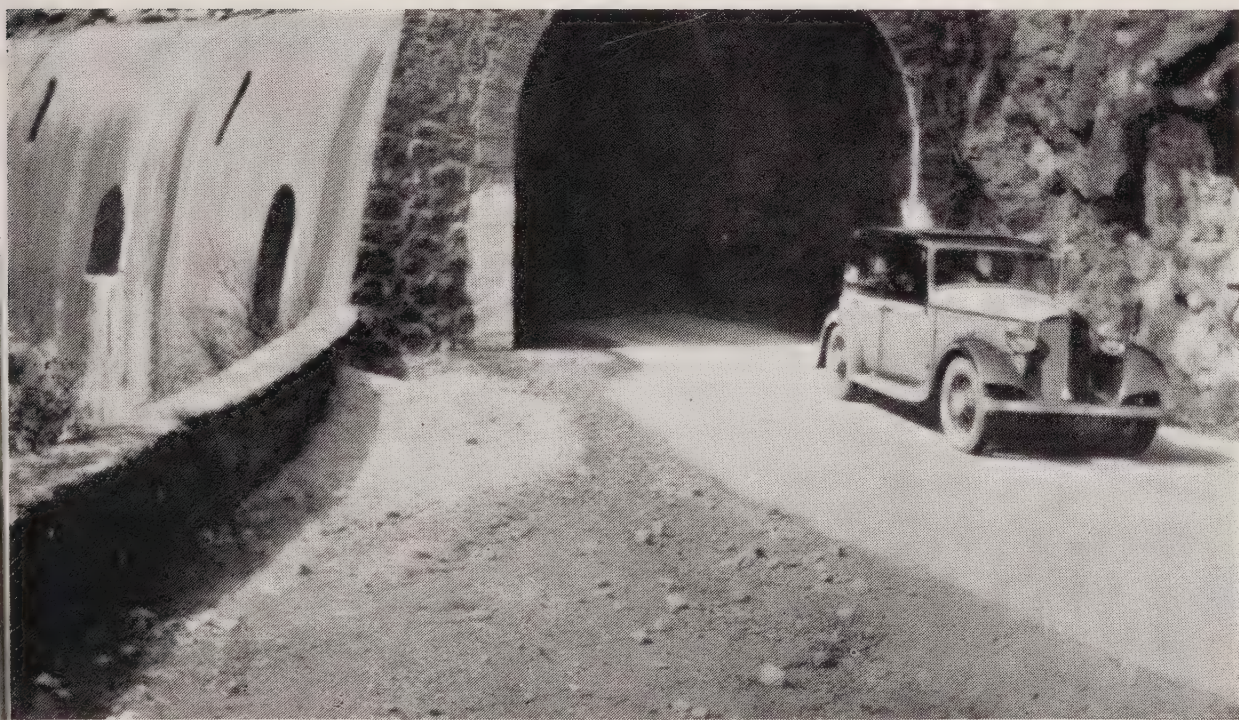
BOUGIE TO PHILIPPEVILLE

The country immediately behind the coast between Bougie and Philippeville consists of the Petite Kabylie, or Kabylie des Babors, and the Kabylie de Collo. In this section only that part of the Kabylie de Collo west of the Oued Safsaf, which reaches the sea at Philippeville, is included. South of this highland lies the region of the high plains of Sétif and Constantine, stretching to the Hodna and Aurès mountains. The Monts du Hodna overlook to the south the depression of the Hodna plain and the Chott el Hodna, while the Aurès prevent easy access to the great depression of the Ziban and the Chott Melghir.

The general road pattern is very regular. There are two major west-east roads—the coastal route, which continues the Algiers-Bougie road, and the continuation of the main inland highway from Sétif to Constantine. These are linked by a number of devious north-south roads which serve the Kabylie des Babors and the Kabylie de Collo. From Sétif and Constantine routes lead south through the high plains and cross the Aurès by narrow defiles to the



80. *Dar el Oued viaduct over Oued Guellili, 4 miles north of Mansouria on the Bougie-Djidjelli road (N. 12)*



81. *Artificial tunnel built to protect road from falls of rock and water in the Chabet el Akra (N. 9)*

Pont d'Aumale



82. Looking west from Sidi Mecid bridge, Constantine: Pont d'Aumale in middle distance

Sahara. These routes are linked by roads running south-east across the plains and continuing eventually to the Tunisian frontier.

Coastal Road

21. BOUGIE-PHILIPPEVILLE. N. 9, N. 12. 162 miles (260 km.)

The mountains of the Kabylie des Babors lie very close to the sea all round the Golfe de Bougie, from Cap Carbon in the west to Cap Cavallo in the east, and form very steep cliffs. The coastal road (N. 12) is built 'en corniche' as far as Cap Cavallo with many tunnels and bridges (Photos. 78-80). It then continues through well-wooded country to Djidjelli, where it turns inland to cross two streams before returning to follow the coast again as far as the mouth of the Oued el Kebir. Here it turns inland to avoid Djebel el Goufi and the mountains of the Cap Bougaroun peninsula, and follows the valley of the Oued el Kebir inland to el Milia (103 miles, 164 km.). It then crosses the Kabylie de Collo, passing through the forests of Beni Toufout by an undulating course to Philippeville (162 miles, 260 km.). Routes branch off from the coastal road, and cross the mountains to the main inland highway at Souk et Tnine, Duquesne, el Milia, and Philippeville.

Interior Roads

22. BOUGIE-SÉTIF. N. 9. 69 miles (111 km.)

At Souk et Tnine (22 miles, 35 km.) the main road from Bougie to Sétif turns southward from the coastal road and rises into the high-land through the narrow, well-wooded valley of the Oued Agrioun, passing through the Chabet el Akra, a gorge $4\frac{1}{2}$ miles long between Djebel Adrar Amellal on the east and the slopes of Djebel Takoucht on the west (Vol. I, Photo. 13). The road, which has numerous sharp turns and steep gradients, is cut in the valley side well above the level of the river, and in places passes through tunnels which protect it from falls of rock and water (Photo. 81). The road leaves the gorge at Kerrata and rises with a very winding course to the plateau of Sétif, which it crosses to the town of Sétif (69 miles, 111 km.).

There is another road from Bougie to Sétif through Oued Amizour and Ain Roua, but this is a very difficult and exposed mountain road, known as the Chemin des Crêtes. It has many sharp turns and steep gradients, and much of it is above 3,000 feet. It joins N. 9 about 3 miles north of Sétif.

23. DJIDJELLI-DUQUESNE-CONSTANTINE. C. 2. 103 miles (165 km.)

This road branches from the main coastal road at Duquesne. It rises gently from the coast southward to Mila (60 miles, 96 km.), and nowhere is very hilly except near Constantine when it reaches the Rummel valley. It enters Constantine (103 miles, 165 km.) by the Route Bienfait, after joining the main Philippeville-Constantine road at the cross-roads just south of the Pont d'Aumale (Photo. 82).

24. COLLO-EL MILIA-CONSTANTINE. C. 39, N. 27. 95 miles (154 km.)

This second-class road provides a connexion from Collo, a small port on the eastern side of the Cap Bougaroun peninsula, to Constantine. It passes through the cork-oak forests of the Bougaroun peninsula, climbing by a devious route and with many steep gradients over the southern arm of Djebel el Goufi before descending to the valley of the Oued el Kebir at el Milia (42 miles, 68 km.), where it crosses the main coastal road. The road southward from el Milia to Constantine follows the right (east) bank of the Oued el Kebir (Oued Rummel) through hilly country, to join the Philippeville-Constantine road 2 miles north of the Pont d'Aumale.

25. PHILIPPEVILLE-CONSTANTINE. N. 3. 54 miles (87 km.)

To the north of Constantine lie the Monts de Constantine, beyond which hilly country slopes gradually down to the coast. The Oued Safsaf rises in the Monts de Constantine and cuts across them to reach the sea at Philippeville. This valley forms a natural routeway for the main road from Philippeville to Constantine. The road rises through the valley of the Oued Safsaf to the Col des Oliviers (1,840 ft.), crossing the ridge of el Kantour and then following a sinuous course to the Smendou valley and Constantine (54 miles, 87 km.).

26. SÉTIF-CONSTANTINE. N. 5. 79 miles (126 km.)

The Sétif-Constantine road is a continuation of the main Algiers-Sétif road described on pp. 309-310. From Sétif it crosses a series of plateaux and small hills to Châteaudun du Rummel (44 miles, 70 km.), where it enters the valley of the Oued Rummel. It follows this valley to Constantine (79 miles, 126 km.) except where the river passes through deep gorges.

Sétif is the main route-centre of the western part of this section. There is a good road network for 20 miles around the town, with main roads to the north, west, and east already described (N. 9 and



83. Constantinople from the north-east: railway station on left



84. Corniche road north of Constantine: Philippeville road (N. 3) in distance

N. 5). To the south a road leads across the *Monts du Hodna* to the *Chott el Hodna* and Biskra, joining the main Constantine-Biskra road (N. 3) at MacMahon, 22 miles (35 km.) south of Batna.

Constantine is the main inland road centre of the eastern part of the section (Fig. 73), again with a good local network. The town has a very striking position, standing above the gorge of the *Oued Rummel* (Photos. 6, 7); the numerous bridges and viaducts marking the exits from the town are shown in Fig. 16 and Photo. 83. Many of the roads are fine examples of road engineering, being cut into the cliff side and embanked (Photo. 84).

27. CONSTANTINE-BATNA-BISKRA. N. 3. 146 miles (235 km.)

To the south of Constantine stretch the high plains and plateaux of Constantine, dotted with numerous salt lakes and isolated mountains, which form the main hindrances to road communications. The most important road southward is to Batna, Biskra, and Touggourt, which is one of the great penetration lines into southern Algeria. From Constantine the road follows the valley of the *Oued bou Merzoug* for about 25 miles (40 km.) to el Guerrah, and then continues across an undulating plateau broken by salt lakes and by hills, which are either barren or scrubby. The road passes between two small salt lakes, the *Sebkha ez Zemoul* and the *Chott Tinecilt*, and continues in a south-westerly direction into the Aurès mountains to Batna (73 miles, 118 km.; 3,280 ft.).

From Batna the main road goes in a south-westerly direction, rising to 3,540 feet and then descending continuously to Biskra. It follows the valley of the *Oued el Ksour* from MacMahon (95 miles, 153 km.) and gradually enters much more arid country where the rivers have cut deep gorges. Here the road winds and has many steep gradients. It reaches the valley of the *Oued Guebli* and follows the left bank, until it rises on a cornice through a narrow gorge above the right bank to el Kantara (Photos. 85, 116, 117; Vol. I, Photo. 15). El Kantara has one of the most striking sites in Algeria, for here the road and railway, descending from the rocky plateaux, leave the mountains and enter the open wastes of the Sahara. This defile through the highland is the gateway to the south, and from here the road crosses numerous streams. Shortly before reaching Biskra (146 miles, 235 km.) it crosses a ridge of highland by the *Col de Sfa*, and has several sharp turns and steep gradients. From Biskra the road continues southward for 137 miles to the oasis of Touggourt (Photo. 87), and crosses the desert as the Ajjers route (p. 338).

Roads of the Aurès

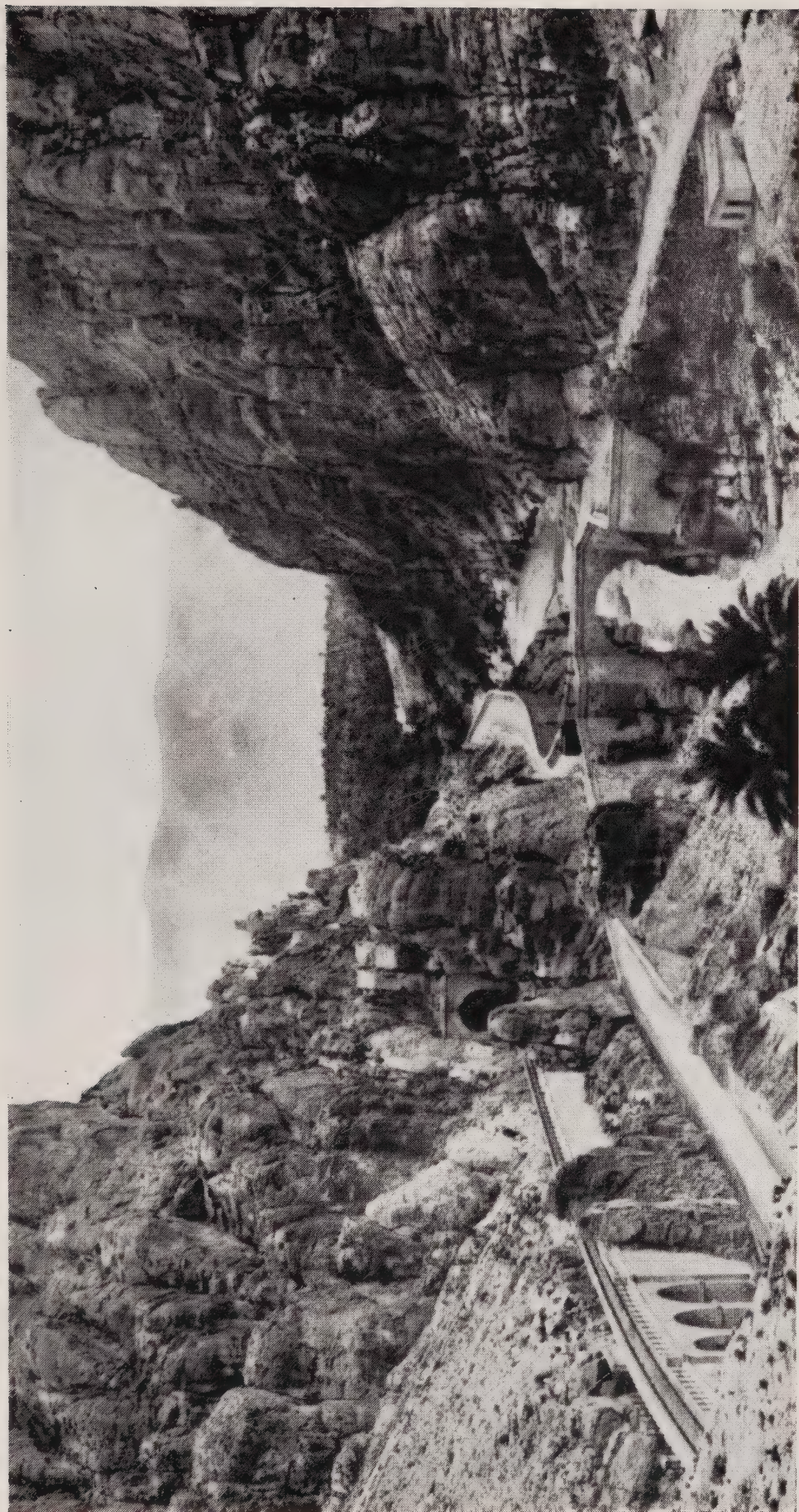
The route centre of Batna controls the approaches to the Aurès mountains. The roads of these highlands are limited to the numerous parallel valleys. The main road to the east from Batna (C. 20) leads along the northern edge of the Aurès mountains, past the site of the ancient city of Timgad to Khenchela (65 miles, 105 km.), a local road-centre with a number of tracks leading through the Saharan Atlas and south-eastward to the oasis of Négrine. From the Batna-Khenchela road there are branch roads uniting the valleys of the Oued Abdi and Oued el Abiod and leading through the mountains to Biskra. The roads from Batna to the west and north-west lead across the forested chains of Djebel Touggour and Djebel Chellala through the Bellezma plateau to the Monts du Hodna and to Colbert and Sétif. Many of the roads of this region are rough and stony (Photo. 86).

PHILIPPEVILLE TO TUNISIAN FRONTIER

(FIG. 73)

The coastal sector consists of the isolated massif of Djebel Edough, west of Bône, and a great belt of marshes formed by the Oued el Kebir, Lac Fetzara, the lower valley of the Oued Seybouse, and other streams. These stretch south of Djebel Edough nearly to the Tunisian frontier, and prevent the building of main roads close to the coast. South of the marshes rise the uplands of the Constantine-Guelma region and the Monts de la Medjerda, which continue into Tunisia. Few roads cross these hills either in the east or in the west; only in the centre (south of Bône) are they crossed by fair communications. River valleys, particularly that of the Oued Seybouse, provide such routeways as exist. South of the mountains the country continues to rise to the high plains and plateaux, which are crossed by the Oued Seybouse (Oued Cherf), the source of which is near Ain Beida. Southward again the plateaux rise to the Monts des Nemencha.

The general pattern of roads resembles that of the previous section. There are two major west-east roads: in the north the Philippeville-Bône-Tabarka road, generally following the inner edge of the marshy belt, and, farther south, the continuation of the main central highway from Constantine through Guelma to Souk Ahras. These two routes are linked by transverse roads which continue southward across the central plateaux. The roads of the coastal area



85. Railway, road, and river in gorge of el Kantara (N. 3)



86. *Road in the Aurès leading to the village of Tifelfel*



87. *Road between Biskra and Touggourt*

centre on Bône. Inland the focal points in the west of the section are Guelma in the Seybouse valley and on the central highway, and Ain Beida, about 70 miles farther south. In the east the main road and rail centres are Souk Ahras and Tébessa, which lie in the hills near the Tunisian border, about 84 miles from one another, and control the inland routes into Tunisia.

Coastal Road

28. PHILIPPEVILLE-BÔNE-TABARKA. N. 12. 148 miles (238 km.)

From Philippeville this road crosses the Oued Safsaf and runs along the right bank of the river through vineyards before it turns south-eastward to climb through wooded and hilly country; it then descends again to Jemmapes (20 miles, 32 km.), from which several local roads radiate. The main road then continues eastward across the Oued el Kebir and along the northern shore of Lac Fetzara to Bône (63 miles, 101 km.). On the eastern side of Bône it runs south-eastward across a flat cultivated plain, crossing the Oued Budjema (bou Djema), the Oued Seybouse, and the Oued Namoussa, and passes between marshy ground on the north and scrubby foothills on the south. From le Tarf (103 miles, 165 km.) the main road turns north towards the coast through a region of lakes and cork-oak forests to la Calle (116 miles, 187 km.). A narrow-gauge railway runs alongside the road between Bône and la Calle. From la Calle to Tabarka in Tunisia there are two routes: both climb forest passes, the northern rising to 1,500 feet, and the southern (the main road N. 12), reaching about 2,000 feet.

Local Coastal Roads

Between Philippeville and Jemmapes N. 12 is duplicated by an alternative route to the south through St. Charles, and between Philippeville and Ain Mokra (on the northern shore of Lac Fetzara) by an indifferent road which runs closer to the coast. The latter road crosses the Oued Safsaf by a reinforced-concrete bridge of seven spans (Photo. 89), passes through Jeanne d'Arc, and skirts the Massif du Filfila to reach Ain Mokra. Herbillon, on the coast, is linked to N. 12 at Ain Mokra, and also directly to Bône across Djebel Edough.

Interior Roads

29. CONSTANTINE-GUELMA-SOUK AHRAS. N. 20, N. 21. 124 miles (200 km.)

The main inland route across Algeria continues through this

section from Constantine to Guelma and Souk Ahras, whence there are two main roads into Tunisia. From Constantine the main road runs south-eastward along the valley of the Oued Rummel to le Khroub and then turns eastward across the hilly country which forms the divide between the Oued Rummel and the Oued Seybouse. It enters the valley of the Oued Zenati, which it follows to the town of Oued Zenati, and then goes directly across the highland to Guelma: the railway, in contrast, follows the long winding course of the river. Some miles before Guelma, at the point where the Oueds Cherf and Zenati join to form the Oued Seybouse, the road rejoins the valley and follows it through Guelma to Duvivier. Here it joins the main Bône-Souk Ahras road. From Souk Ahras the two main roads into Tunisia lead north-eastward to Ghardimaou and eastward to le Kef.

Souk Ahras-Ghardimaou. N. 21. 43 miles (69 km.). The valley of the Oued Medjerda forms a good natural routeway into Tunisia, and the road to Ghardimaou is undulating with many sharp corners. It keeps well above the river valley until it reaches Ghardimaou. Shortly after leaving Souk Ahras it crosses the Oued Djedra and then ascends 'en corniche' to 2,950 feet. The road to Lamy and la Calle branches to the left, 13 miles (20 km.) from Souk Ahras. Beyond the Tunisian boundary there is a rapid descent with several difficult corners to the upper Medjerda plain, and the last 2 miles to Ghardimaou (43 miles, 69 km.) are more or less level.

Souk Ahras-le Kef. C. 30. 58 miles (93 km.). This road into Tunisia runs eastward through mountainous country. It descends to the upper valley of the Oued Medjerda, which it crosses, and later passes through the Hammam Tassa defile. It follows the valleys of the Oued el Baten and the Oued Maiza, and then rises and winds along the flank of a ridge of highland. The road crosses the frontier at Sakiet Sidi Youssef (2,635 ft.) and descends to the valley of the Oued Mellègue, which it crosses before reaching le Kef (58 miles, 93 km.).

30. PHILIPPEVILLE-GUELMA. N. 12, D. 5. 55 miles (88 km.)

This is the only road across the Monts de Constantine in the western part of this section. It becomes a secondary and rather narrow road after leaving the Philippeville-Bône road 7 miles (11 km.) east of Jemmapes. It follows the highland and descends to the valley of the Oued Seybouse, which it crosses before entering Guelma (55 miles, 88 km.).

31. BÔNE-GUELMA-AIN BEIDA-KHENCHELA. N. 20, C. 1. 142 miles (228 km.)

The main road from Bône to Guelma (N. 20) runs south-westward from Bône across the low-lying plain between the Oued bou Djema and the Oued Seybouse, following the Bône-Souk Ahras road for the first 6 miles. The Oued bou Djema is crossed by the Pont d'Hippone, an ancient stone bridge with eleven arches and 130 yards long. There is then a long ascent of 30 miles to the Col de Fedjoudji (1,840 ft.), followed by a rather steep, winding descent across the western slopes of Djebel Aouara down to the Seybouse valley. The river is crossed by a single-span bridge, 60 yards in length (Photo. 88), about $1\frac{1}{2}$ miles from Guelma (40 miles, 65 km.).

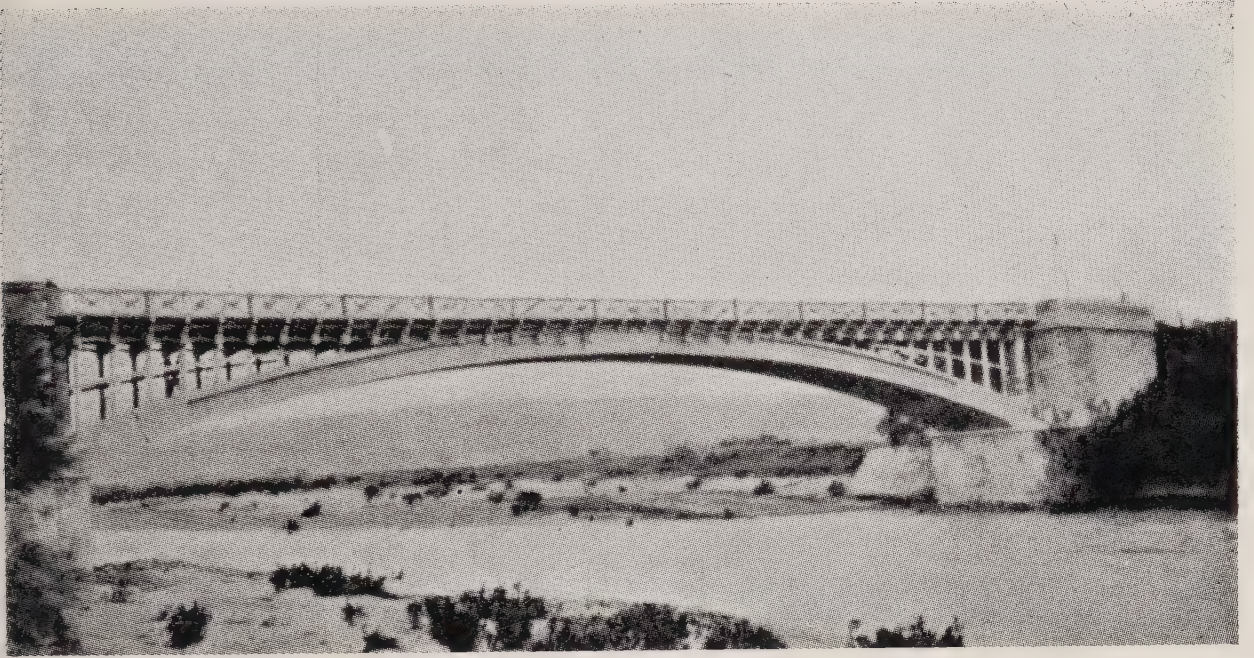
The country south of Guelma is hilly, but numerous roads cross it, the most important being that south to Ain Beida (112 miles, 180 km.; C. 1). This road crosses hilly country to reach the upper basin of the Oued Cherf (Seybouse), and to climb up to the plateau on which Ain Beida stands. It crosses the road from Constantine to Tébessa (N. 10) at Ain Beida and continues southward across the plateau to Khenchela (142 miles, 228 km.).

32. CONSTANTINE-AIN BEIDA-TÉBESSA. N. 10. 126 miles (203 km.)

The main road from Constantine to Tébessa forks south-east from the Constantine-Batna road (N. 3) near Ouled Rahmoun. It crosses the high plains of Constantine and is generally hilly, but not difficult. All the bridges are modern and wide concrete structures. The road winds up to the Col d'Ourkis (3,200 ft.) and then descends before rising again slightly to Ain Beida (71 miles, 114 km.). From Ain Beida to Tébessa the road is good, although winding and hilly: it was completed for military purposes in 1940, and is 39 feet wide, including a 10-foot track at the side for troops or camel caravans. The road first rises to a mountain pass (3,570 ft.), and then descends again, passing through an alfa-covered plain to la Meskiana (94 miles, 151 km.). It climbs through the Ain Halloufa defile, and descends once more to cross an open, monotonous plateau to Tébessa (126 miles, 203 km.).

33. BÔNE-DUVIVIER-SOUK AHRAS-TÉBESSA. N. 21, N. 16. 145 miles, (234 km.)

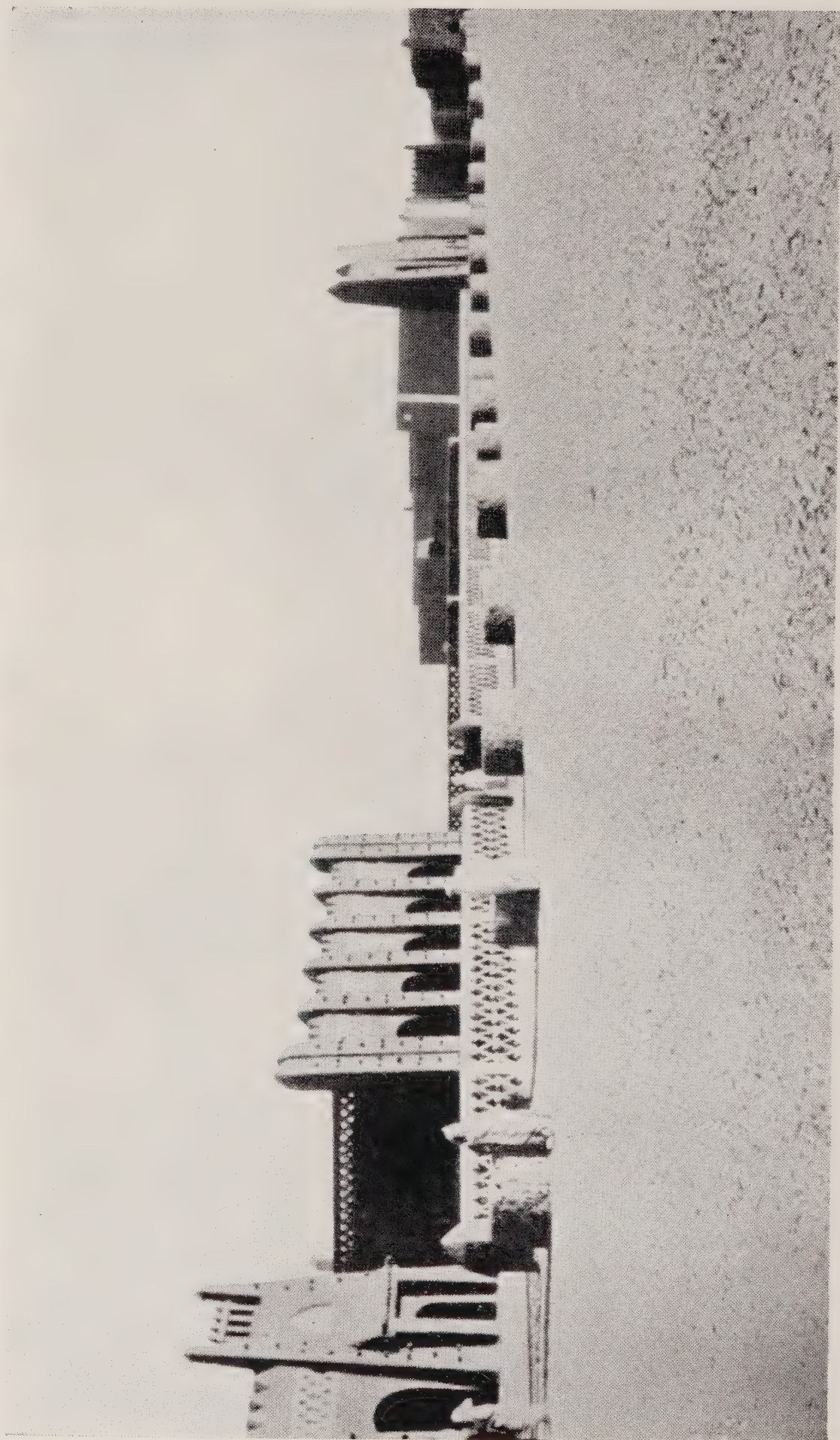
This road follows the valley of the Oued Seybouse from Bône through the highland to Duvivier and Souk Ahras. The slopes of the highland are well wooded, and the valley is fertile and well cultivated,



88. *Héliopolis bridge over Oued Seybouse north of Guelma (N. 20)*



89. *Bridge over Oued Safsaf near Philippeville (C. 12)*



mainly with vineyards. Between Mondovi (14 miles, 23 km.), where the valley narrows, and Duvivier (37 miles, 59 km.) the road and railway are close together, rising gradually alongside the river. At Duvivier the road is joined by the main highway from Constantine, and from here to Souk Ahras (62 miles, 100 km.) the road narrows considerably through very mountainous country. It climbs and winds through the western end of the *Monts de la Medjerda*, the slopes of which are well wooded and steep. Very few roads penetrate the country on either side.

From Souk Ahras the road (N. 16) continues south to Tébessa. The first 12½ miles are very difficult and winding, through mountainous country. After crossing another mountainous stretch the road reaches the high plain on which Tébessa (145 miles, 234 km.) is situated. Tébessa is an important road-centre with roads leading north-west to Ain Beida, north-east to le Kef, and south-east to Feriana and Gafsa in Tunisia, while numerous tracks lead south towards the Sahara.

34. LA CALLE-SOUK AHRAS-SÉDRATA. N. 12, C. 9, C. 7. 100 miles (162 km.)

This is the most easterly of the roads of Algeria, running roughly parallel to the Tunisian boundary as far as Souk Ahras, and forming a cross-country link with the high plains. The road C. 9 branches off from the Bône-Tabarka road (N. 12) at le Tarf, 14 miles south-west of la Calle, and crosses the *Monts de la Medjerda* to Souk Ahras (67 miles, 108 km.): it is a difficult road across wooded country. Beyond Souk Ahras the road (C. 7) continues south-westward through a hilly region to join the Guelma-Ain Beida road (C. 1) at Sédra (100 miles, 162 km.).

TRANS-SAHARAN ROUTES

Camel and Motor Transport

A brief account of trans-Saharan trade and routes, which from antiquity have depended on the camel, has been given elsewhere in this volume (p. 277, Fig. 68). The various schemes for a trans-Saharan railway are discussed in Appendix D.

The use of the camel to maintain commerce and communications within and across the desert is limited by distances between water-points, availability of grazing or browsing, and to some extent by the

nature of the surface. For most purposes time occupied in such a journey is of secondary importance, and in any case is prolonged and cannot be reduced by an appreciable amount. Season of the year plays a certain part in the movement of caravans: journeys should be undertaken in the winter months because pasture, and to some extent watering facilities, are better then than in the height of summer. Moreover fatigue and exhaustion, involving loss of animals and men, are greater in summer than in winter; but they can be mitigated by travelling at night, and resting by day or during the hottest hours of the day. It must be remembered, however, that a trans-Saharan camel journey may take several months and extreme temperatures are then inevitable at one end or the other. So far as commerce and communications are concerned the journey by camel may be regarded as a series of stages in which animals and men may be changed at certain points.

The introduction of efficient motor transport, a product of the last quarter of a century, has changed nearly all the limiting factors mentioned above and has introduced others. Distances between water-points may be very great, far beyond the range of the camel caravan: refuelling and some repairing facilities are essential at certain stages. Nature of surface is crucial but, along the main routes, it has been ensured by minor improvements or engineering works. Time, for practical purposes, is a factor, the leisurely camel journey being replaced by a need or desire to make all available speed. The journey does not extend from one season to another, so choice of season (avoiding the hottest weather) is made when possible. It should be noted, moreover, that night travel by car in desert can be safely undertaken only in ideal circumstances, or by drivers with long experience of the road.

The Motor Routes

The motor routes in their present form represent a compromise between the following of known and long-established camel routes; the utilization of good going remote from those routes enabling short cuts to be made between distant water-points; the military requirements of occupation, pacification, and administration; and the results of reconnaissance and exploration. As the use and equipment of the main motor routes develop, new alinements will no doubt take place and new nodal points will appear in places which now seem unpromising: the establishment of Bidon Cinq, about 315 miles (510 km.) south of Reggan in the inhospitable Tanezrouft (Vol. I,

pp. 79–80), is an example of this development. Its history is as follows. In 1923 an expedition organized by the C^{ie} générale Transsaharienne to reconnoitre the most direct route between Algeria and the Soudan placed empty petrol containers (*bidons*) at 50-kilometre intervals on the return journey from Tesalit, the last inhabited place in the Soudan; Bidon Cinq was the position of the fifth of these markers. Several years later, the route across the Tanezrouft having proved to be practicable, the company decided to establish a revictualling point between Reggan and the first post in the Soudan: a dump of petrol and water was made at Bidon Cinq. In 1930, during the 'Rallye Saharien Méditerranée–Niger', the Algerian authorities set up at Bidon Cinq a provisional camp and wireless station, because the Tanezrouft could not be crossed in a single stage. In the same year the C^{ie} générale Transsaharienne established there a petrol pump and sleeping accommodation. In 1934 a landing-ground and refuelling point were set up for General Vuillemin's trans-desert flight, and in the following year a 100-foot lighted beacon for aircraft was added. The place has thus become an essential link between Algeria and the Niger: it is inhabited only from October to May by a native watchman (Photo. 92).

It is to be supposed that for a time the interdependence of motor and aircraft routes across the Sahara will lead to similar improvements and modifications of facilities and routes, but that the increasing range and capacity of aircraft will require little more than emergency desert landing-grounds. Ultimately aircraft may supplant motor transport for the trans-Saharan journey, and the roads fill other roles or fall into disuse.

It will be observed that the main trans-Saharan routes are essentially north–south, traditionally as means of exchange for European and tropical African commerce, now primarily to enable officers, officials, and other travellers to pass between Europe and tropical Africa: or to reach southern Africa and Madagascar, especially by air. There are numerous motor routes which run approximately east–west, many of them following, or approximating to, camel routes, but under modern conditions most of them are link roads between the north–south communications of the Algerian Sahara and of Libya.

The present position is that the motor routes are in part well known and well organized, in part in an exploratory stage, all of them overshadowed (so far as long-distance use is concerned) by the likely development of air routes, and the main road to the Soudan may give place to the trans-Saharan railway if that long-planned project

is carried out (Appendix D). In these circumstances, therefore, the routes given below are stated in general terms and not in detail.

Passability

No route should be used, unless in an emergency, without inquiry from official and semi-official sources (including commercial organizations): the French authorities have formulated precise regulations for the proper use of vehicles and routes. The routes are tracks, not roads: they may be marked by stones, empty tins, drums, or other devices, or there may be no other guide than tyre-marks of vehicles or tracks cleared of boulders in rocky country. In their more featureless sections the routes are easily lost and may be obscured by drifting sand; they can be regained only by retracing, and not by attempted short cuts: it is especially for this reason that motoring at night is hazardous. Surfaces may be soft sand, loose clay and pebbles likely to form wavy or corrugated surfaces with much use, hard gravel and sandy patches, or bare hard rock. Engineering works along the routes are found usually where the track crosses escarpments (here substantial road-making may be undertaken) or at crossings of dry watercourses. The nature of surface may change rapidly, and the main danger of broken springs, axles, and other parts lies in the use of undue speed (changes of surface being difficult to observe). Corrugated surfaces, boulders, and dry water channels impose severe risk of major breakage unless traversed slowly. Night-driving presents dangers in this matter; moreover at night rapid changes of gradient at the tops of ridges and in dry watercourses are difficult to see.

Speed

Speed on the desert routes depends not only on the type of vehicle and nature of surface but on desert-driving experience. There are stretches of routes where high speeds may be attained, but specialized skill and experience are necessary to ensure that at high speed the track is not lost, especially when the sun is high in the sky and marks are difficult to follow, and that changes of surface are noted in good time. Every type of surface demands its own technique of driving. Excessive speed is responsible for more breakdowns, accidents, and delays than any other cause in deserts, as on ordinary roads: but in desert the consequences may be grave. On good going lorries might average 15 m.p.h. Corrugated, rocky, and soft ground may be expected to

reduce the speed of lorries and other unspecialized vehicles to 4–8 m.p.h. Vehicles specially adapted for desert work (oversize tyres, light load, and high horse-power) may be expected to maintain high average over soft sand, but corrugated and rocky surfaces necessitate great care and slow speed.

Summary of Trans-Saharan Routes (Fig. 74)

Three routes are in regular use, are marked, and improvements are carried out along them; difficult stretches are few:

1. The Mauritanian route.
2. The Tanezrouft route.
3. The Ahaggar or Hoggar route.

Four routes are used only occasionally, are poorly marked, and are difficult:

4. The Djouf route.
5. The Salt route.
6. The Ajjers route.
7. The Eastern Erg and Tibesti route.

Only the main features of Routes 4–7 are described in this chapter.

Of the above only certain sections lie within the Algerian Sahara, but the general bearing of each on trans-Saharan communications will nevertheless be given (*see* Geographical Handbooks, *French West Africa* (B.R. 512) and *French Equatorial Africa* (B.R. 515)). Locations of landing-grounds and of petrol and oil stocks are omitted. The routes are shown in Fig. 74. Conversions of kilometres to miles are based solely on the tables in the handbooks: they will, therefore, show small variations when compared with some other sources of information. They are given to the nearest mile where distances are considerable, and to the nearest tenth of a mile where distances are short or the feature indicated is small or likely to be difficult to find (e.g. a well).

I. THE MAURITANIAN ROUTE

The Mauritanian route joins the Moroccan road system (*see* Geographical Handbook B.R. 506 A) to Senegal, including St. Louis and Dakar. It passes along the Atlantic coastal plain of south-western Morocco through Agadir and Tiznit, crosses the Anti-Atlas mountains by Kerdous and Icht, and traverses the Oued Draa and the Draa hammada to Tindouf. Thence it continues in a southerly direction

near the boundary of the Rio de Oro and shortly passes out of Algerian territory into French West Africa. The route continues through Ain ben Tili, runs westward, and then follows the general line of the boundary of the Rio de Oro through Fort Gouraud and Atar, whence it runs south-westward to the Atlantic coastal plain, which it follows, passing inland to cross the river Senegal near Rosso and regaining the coast at St. Louis.

<i>Distances from Tiznit</i>	<i>Miles</i>	<i>Km.</i>
Tindouf	281	452
Ain ben Tili	479	771
Fort Gouraud	885	1,424
Atar	1,071	1,724
St. Louis	1,609	2,590

Description

Tiznit–Tindouf (281 miles, 452 km.). This is mostly good going, well engineered through the Anti-Atlas, passing through a few villages and water-points. There are military posts at Foug el Hassane (113 miles, 182 km.) and at Tindouf (a small oasis); tracks leave the main route, including that to Tabelbala (Fig. 74).

Tindouf–Ain ben Tili (198 miles, 319 km.). The section is mostly good going, with some patches of sand-dunes which are not serious obstacles, but it is waterless. There is a military post with a well at Ain ben Tili, but no food is obtainable. Two tracks leave the route for Bir el Ghzaim (one of them Route 4), and an alternative route to Ain ben Tili crosses the south-east corner of the Rio de Oro.

Ain ben Tili–Fort Gouraud (406 miles, 653 km.). The route is varied, but on the whole good going over rock and pebble surface (reg). The last 18 miles (30 km.) to Fort Gouraud are rough, with sharp turns, and near the fort there are sandbanks. There are wells at Bel Guerdane (80 miles, 130 km.), at 205 miles (330 km.) (1.2 miles, 2 km., to the left of the track), at 385 miles (620 km.) (6.2 miles, 10 km., to the right), and at Fort Gouraud. There are military posts at Bir Moghreine (with wireless) (165 miles, 266 km.), and at Fort Gouraud (with wireless), where there is a native village (Ijil), but food is scarce. Several tracks leave the route (Fig. 74).

Fort Gouraud–Atar (186 miles, 300 km.). This section is difficult, traversing sand-dunes, soft sand, rough rock, and stony ridges. There are wells at Char (87 miles, 140 km.) (1.2 miles, 2 km., left of the track), Aouinet el Mlis (156 miles, 252 km.), and Ksar Torchane (173 miles, 278 km.). The military post at Atar has wireless and a garage. There are several tracks leaving the route (Fig. 74).

Atar-St. Louis (538 miles, 866 km.). The route is very varied, much of it good. At Akjoujt (124 miles, 199 km.) there is a military post and native village with water-point and wireless. The military post (with village and wireless) at Nouakchott is 4.4 miles (7 km.) from the Atlantic shore. South of Nouakchott the track used in the wet season turns inland, the dry-season track following the coast: the tracks reunite at Rosso (where there is a garage), and the river Senegal is crossed by ferry. St. Louis stands on an island in the river and is joined by bridge to the mainland. There are a few wells along the route at Ain Taya (24.8 miles, 40 km.), Bourjeimat (intermittent, at 198 miles, 319 km.), Toueila (279 miles, 449 km.), and Assi Gaboun (285 miles, 458 km.); between 304 miles (489 km.) and 354 miles (569 km.) they are numerous. Tracks leave the main route (Fig. 74).

2. THE TANEZROUFT ROUTE

The Tanezrouft Route joins the road system of Algeria to the French Soudan and the Niger, leading especially from Oran and Algiers to Gao and Niamey. From the north, leaving N. 6 near le Kreider (p. 307), it passes through Ain Sefra and Colomb Béchar, traversing the country of the Oued Saoura-Oued Messaoued (Vol. I, p. 67) and the vast and featureless Tanezrouft. Near the southern margin of the Tanezrouft it crosses the boundary of French West Africa and continues through broken country and scrub to the Niger at Gao. Routes lead westward from Gao and Bourem to Timbuktu, Bamako, and Kayes, and eastward to Niamey and Zinder. From the approximately west-east Kayes-Zinder road routes take off southward into the French and British territories of the Guinea coast.

It is a well-engineered route and may be followed without difficulty. It was regularly used in peace-time by the motor services of the C^{ie} générale Transsaharienne as follows:

Colomb Béchar to Niamey, weekly service from October to May.
Reggan to Colomb Béchar, bi-monthly service from June to September. Leaving Colomb Béchar on Friday the omnibus reached Reggan on Saturday, and remained there over Sunday: Bidon Cinq was reached on Monday, Tabankort on Tuesday, Gao on Wednesday, and Niamey on Thursday.

The chief difficulty is the long waterless stretch over the Tanezrouft: the only available well between Reggan and Aguelock is at Ouallen, which is 43 miles (69 km.) off the road.

Difficult stretches are indicated below: considerable improvements are stated to have been made between Bidon Cinq and Gao.

<i>Distances from Ain Sefra</i>	<i>Miles</i>	<i>Km.</i>
Colomb Béchar	143	230
Beni Abbès	294	474
Adrar	551	887
Reggan	642	1,033
Bidon Cinq	959	1,543
Aguelock	1,213	1,953
Gao	1,547	2,490

Description

Ain Sefra–Colomb Béchar (143 miles, 230 km.). At Ain Sefra (p. 58) the route is joined to the Algerian road system by the road north to le Kreider (p. 307). Ain Sefra is also on the Kenadza–Oran railway (p. 370), which the route duplicates as far as Colomb Béchar, passing alongside, or near, several of the railway stations. The track crosses the railway by level crossings in a number of places. The section is mostly good going, with a few sandy stretches and crossings of oueds. The Oued Zousfana is crossed by a causeway. There is a military post with garage, railway station, and two hotels at Beni Ounif (75 miles, 121 km.), 10.4 miles (7 km.) from which is the Figuig oasis. Colomb Béchar consists of European and native towns with a military post (p. 69).

Colomb Béchar–Beni Abbès (151 miles, 244 km.). The going is good to Menouarar, then rough for about 9 miles (15 km.), and thereafter good or very good. From the southern approaches to Colomb Béchar tracks lead to Kenadza and Abadla. There are military posts at Menouarar (34 miles, 55 km., water but no food or accommodation), Taghit (59 miles, 95 km., hotel and drinking-water), Igli (104 miles, 167 km., native villages, wireless, drinking-water, food scarce), and Beni Abbès (p. 61). There is also a well at Oglat Gherassa (18.6 miles, 30 km.). There is a monument at 44 miles (70 km.), and a monolith inscribed 'Boulevard du Premier Étranger' at 97 miles (158 km.). There are several tracks leaving the route: to Abadla at 6.8 miles (11 km.) and 129 miles (217 km.), to Tabelbala at 137 miles (221 km.), and to Adrar at 140 miles (225 km.); the last is a by-pass connecting with the main route to Adrar which takes off at 147 miles (236 km.): all these are on the right. Taghit is a mile or two to the left of the main track, and is joined to it by road. The route traverses the Saoura valley. Beni Abbès is a village with a military post (p. 61).

Beni Abbès–Adrar (256 miles, 413 km.) (Photo. 91). This section



91. *Marked track with sand patches between Beni Abbès and Adrar*



92. *Bidon Cinq*



93. *Well-engineered gradient, southern slopes of the Tademait*



94. *Oued crossing, southern slopes of the Tademait*

provides varied but indifferent going for the first 145 miles (234 km.) and thence is very good to Adrar. It is poor for much of the first 12 miles (20 km.) after leaving the Beni Abbès-Colomb Béchar road 5 miles (8 km.) from Beni Abbès, with patches of heavy going as far as 37 miles (60 km.): it then negotiates gorges and narrow passages to about 112 miles (180 km.), with difficult sandy patches to about 145 miles (234 km.). There is a military post at the town of Adrar (with wireless, 2 hotels, and drinking-water; Photo. 90). The route also passes through Guerzim (54 miles, 87 km., village), Timmoudi (107 miles, 172 km., village, drinking-water), Foum el Kheneg (149 miles, 240 km., well, drinking-water, no food or accommodation), and three wells just outside Sba (230 miles, 370 km., village, good water). Important tracks leave the route: to Colomb Béchar at 12.4 miles (20 km.), to Kerzaz in the Saoura valley at 76 miles (122 km.), to Ksabi at 145 miles (234 km.), to Timimoun (direct track) at 143 miles (247 km.), to Bou Bernous at 204 miles (328 km.), and to Timimoun at 228 miles (367 km.).

Adrar-Reggan (91 miles, 146 km.). The track is good for the first 19 miles (30 km.) and thereafter is corrugated, but improves towards Reggan. Palm-groves, invisible from the track, stretch from Adrar to Reggan. At 66 miles (106 km.) there is a poorly marked branch (left) of the Sali-In Belbel track. The descent from the plateau at 87 miles (140 km.) is well engineered. Reggan is the last of the Touat oases (Vol. I, pp. 66-68): it comprises native villages and a military post with wireless, hotel, garage, and magnesian water.

Reggan-Bidon Cinq (317 miles, 510 km.). The section is waterless, the nearest source being at Ouallen. The route is marked by petrol cylinders: at 19 miles (30 km.) from Reggan going becomes bad owing to soft sand; between 155 miles (250 km.) and 286 miles (460 km.) it runs over open pebbly desert (reg); at 286 miles there are dunes (Erg el Hofer). A track, not well marked, leaves for Ouallen at 74.6 miles (120 km.), and another, the new track, at 155 miles (250 km.). Bidon Cinq (pp. 324-325; Photo. 92) is occupied only from October to May: there is no food and very little water.

Bidon Cinq-Aguelock (254 miles, 410 km.). For the first 25 miles (40 km.) the track is on firm reg, and then crosses some sandy oueds: it is rocky, hard, and ill defined at 60 miles (90 km.), but improves on reaching the vegetated area. It enters an area of coarse grass, &c. ('prairie'), at 112 miles (180 km.), and at 174 miles (280 km.) passes on to ground cracked in places, with sandy patches. The route passes from Algeria into the French Soudan at 93 miles (150 km.) and

thence is marked by posts at approximately 1-mile (1.5-km.) intervals. Numerous tracks leave the route: at Bidon Cinq a track on the right to Amrenene (water) and Taoudenni; at 112 miles (180 km.), on the left, to Tesalit, where there is very good water, and a proposed new and more direct track also leaves the present route, on the left; there is also a poorly marked track to Silet, on the left. At 236 miles (380 km.), on the left, there are numerous tracks made by vehicles by-passing el Ouig to reach Aguelock. At el Ouig there is a well (242.3 miles, 390 km.) and a difficult direct route to Gao, on the right. At Aguelock there is a military post with native village, good water at 72 feet, and wireless.

Aguelock-Gao (334 miles, 537 km.). This section may be shortened by about 62 miles (100 km.) by returning from Aguelock to el Ouig and driving direct to the Kidal-Gao track, 93 miles (150 km.) from Kidal, but this route is rendered difficult by tufts of vegetation which have collected sand (*mercoubas*). In 1938 a new track was begun to avoid the *mercoubas* without passing through Kidal. The stretch from In Tassit to Gao may be impracticable in the wet season.

The main track crosses numerous oueds: some of these contain fairly dense vegetation and the bush becomes thick as the route is followed southward. From Tabrichat (208 miles, 334 km.) a bad track leads to Bourem, whither a good track goes from In Tassit (229 miles, 369 km.). There is a military post with wireless, native village, and abundant good water at Kidal. Abundant good water is available from wells at Tabankort (depth 100 ft.), Tabrichat (130 ft.), and In Tassit. Gao, on the Niger, is a town with garage, two hotels, wireless, and other facilities.

3. THE AHAGGAR OR HOGGAR ROUTE

The Ahaggar route joins the Algerian road system to that of the Niger Colony and, through Kano, to that of Nigeria. From the north, leaving N. 1 at Laghouat (p. 312) it passes southward through Ghardaia over the Tademait to In Salah, traverses the Tidikelt, and, by Arak, passes into the broken country of the Mouydir (Immidir). The route continues across the western part of the Ahaggar or Hoggar mountains through Tamanrasset (Fort Laperrine) and runs southward to In Guezzam. The country traversed by this route is described in Vol. I, pp. 65-71, 75-78. From In Guezzam the route enters French West Africa and runs south and south-eastward to Agades, thence to join the Niamey-Zinder road, from which roads lead southward into Nigeria.

The route is the shortest between Algeria and Nigeria and the easiest and fastest to French Equatorial Africa. It was regularly used in peace-time by the motor services of the Société Algérienne des Transports tropicaux as follows:

Algiers to Zinder and Kano, fortnightly service from October to May.

Ghardaia to Tamanrasset, weekly service throughout the year.

The journey from Laghouat to Zinder (1,980 miles, 3,163 km.) took thirteen days including five days' stay *en route* as follows: depart Laghouat, Saturday; arrive Ghardaia, Saturday; el Goléa, Sunday; In Salah, Tuesday; Arak, Thursday; Tamanrasset, Friday; In Guezzam, Monday; Agades, Tuesday; Tessaoua, Thursday; Zinder, Friday. Kano is 180 miles (289 km.) from Zinder and 2,160 miles (3,452 km.) from Laghouat. This is a much better-watered route than the Tanezrouft, but is impracticable in the wet season south of In Guezzam. Difficult stretches are indicated below: on the whole there is little difficult sand: there are long stretches of loose stones, the largest of which have been cleared, rocky outcrops, and corrugations.

<i>Distances from Laghouat</i>	<i>Miles</i>	<i>Km.</i>
Ghardaia	127	205
El Goléa	326	525
In Salah	587	945
Arak	770	1,240
Tamanrasset	1,038	1,670
In Guezzam. . . .	1,299	2,090
Agades	1,604	2,581

Description

Laghouat-Ghardaia (127 miles, 205 km.). From Laghouat (p. 82) the route is continued northward by N. 1 (p. 311). Southward the main track, indicated by overhead telephone wires, passes through Tilrempt (58 miles, 94 km., good water at 295 ft., hotel) and thereafter traverses numerous oueds, which are sometimes flooded in the wet season. The route passes through the native town of Berriane (98 miles, 157 km.; Vol. I, Photo. 21), beyond which it is winding with steep gradients, descending steeply in zigzags to Ghardaia (p. 74). There is also a well between Tilrempt and Berriane at 70 miles (112 km.).

Ghardaia-el Goléa (199 miles, 320 km.). This section has rocky ridges, steep slopes, soft sand, and corrugated surface: the crossings of some of the oueds are difficult. On the right a track leads to the

village of Metlili from 13·7 miles (22 km.) and on the left the track from Ouargla joins the route at 134 miles (215 km.): there is also a branch to Hassi el Abiod. There are wells at Hassi Gour (40·4 miles, 65 km.); el Aouda (51 miles, 82 km.), at 170 feet; Hassi Fahl, between el Aouda and Bou Ali, at 175 feet; Bou Ali (104 miles, 167 km.); and Djafou (135 miles, 218 km.), a white concrete well with slightly salt water at 250 feet. El Goléa is a town with a military post (p. 75).

El Goléa-In Salah (261 miles, 420 km.) (Photos. 93-95). Outside el Goléa at 3·1 miles (5 km.) the route approaches the bed of a salt lake, where it is dangerous to leave the track. Small dunes necessitate detours, and the track is stony in places. The ascent on to the Tademait plateau (66 miles, 106 km.) is well engineered, but the last turn is very sharp: the descent (196 miles, 315 km.) is long and steep, with dangerous hairpin bends (Photos. 93, 94). The plateau is covered with black stones, which have been cleared from the track; the going is fast. There is soft sand in places off the track. Tracks leave the route as follows: at 39 miles (63 km.), on right, to Timimoun; at 62 miles (100 km.), on left, to Inifel; at 127 miles (205 km.), on right, to Aoulef via In Belbel. The route to Arak branches off 330 yards before reaching the wells of In Salah. Water is obtainable as follows: branch at 24·8 miles (40 km.), on right, to Hassi Marroket, where there is a little brackish water; Fort Miribel (87 miles, 140 km.), drinking-water; Tababoulet (118 miles, 190 km.), good water at 53 feet, 660 yards on left of track; at 196 miles (315 km.), on left, well of Ain el Hadjaj (2·2 miles, 3·5 km.), drinking-water; Hassi Cazalis (about 25 miles (40 km.) south of Ain el Hadjaj), plentiful good water at 150 feet. A white cairn at 64 miles (103 km.) is stated to mark a new well. In Salah is described on p. 79.

In Salah-Arak (183 miles, 295 km.). This section is mostly over sand interspersed with stretches of gravel (Photo. 96); some of the sand is very soft and difficult, especially the first 20 miles (32 km.) from In Salah. The route runs through hilly and scarp country. There are sharp turns where the track ascends the Arak escarpment at 90 miles (145 km.). At 82 miles (132 km.) a track on the left leads to Amguid. At 110 miles (177 km.) the track forks, and the right track should be followed; the track passes a monument (on left) at 98 miles (158 km.) and a triangular cairn (on right) at 120 miles (193 km.). The route enters the Arak gorges between 180 miles (290 km.) and Arak, where the track to Tamanrasset passes to the right (Photos. 97, 98). Water is available as follows: at Hassi el Khénig (65 miles, 105 km.), well, water scarce; at Tiguelguemine (88 miles,



95. *Marked track north of In Salah*



96. *Stones marking track between In Salah and Arak*



97. *Northern approach to the Arak gorges*

142 km.), good water. Arak has an hotel, wireless, and drinking-water.

Arak-Tamanrasset (268 miles, 430 km.). From Arak the track begins to climb into the Ahaggar mountains (Photo. 99): the first 27 miles (43 km.) need careful negotiation. Some stretches are narrow, and some of the turns very sharp. The gradients in the Ahaggar are well engineered: there are some steep ascents after the village of In Amjel. In places the track runs through gullies and gorges and is bordered by precipices. The main tracks leaving the route are: at 147 miles (236 km.), on left, to Amguid; at 175 miles (282 km.), on left, to Djanet; and at 225 miles (378 km.) to Silet and Tin Zaouaten. There are numerous water-points: at 87 miles (140 km.), on right, Tesnou, poor water; at 152 miles (245 km.), Bordj d'Iniker, drinking-water, food scarce; at 181 miles (291 km.), In Amjel village, good water, food scarce; at 237 miles (381 km.), village of Tit, plentiful good water but food scarce. The track crosses the Oued In Amjel at 180 miles (289 km.); the banks are steep, and the bed sandy and sometimes flooded. Tamanrasset (Fort Laperrine) comprises a town with wireless, observatory, hotel, garage, good water, and swimming-pool.

Tamanrasset-In Guezzam (261 miles, 420 km.) (Photo. 100). After leaving Tamanrasset the track passes through fields of broken stone and then into a rocky wilderness of jagged peaks, rounded domes, and flat-topped mountains. It descends from the Ahaggar massif and crosses dry river valleys bordered by rocky hills. Surfaces are either soft or gravelly sand with rock outcrops, for which a careful watch is imperative. The latter part of this stretch is the most difficult on the route: by camping for the night about 124 miles (200 km.) beyond Tamanrasset, after crossing an extensive plain of hard sand, motorists can enter the region of soft sand (with rocky outcrops) in the early morning, when it is much firmer than at other times.

On the left a track leaves the route at 62 miles (100 km.) for In Azaoua and Iferouan: it is scarcely visible. There is a well at 21 miles (34 km.), 250 yards from the track, and another at 31.7 miles (51 km.); at Tedjerine (In Fedjeg), 37.3 miles (60 km.), there is abundant good water at 33 feet. At In Guezzam (wireless, hotel) there is very good water at 8 feet.

In Guezzam-Agades (305 miles, 491 km.) (Photo. 101). From In Guezzam the track ascends a long slope with bad, soft, sandy patches in the first 3 miles (5 km.): at 4.4 miles (7 km.) it enters the Niger Colony. Areas of firm foundation alternate with patches of soft sand

and the sandy beds of oueds. This district is subject to frequent sandstorms. After In Abbangarit (121 miles, 195 km.) the track is marked by posts. Between Teguidda n'Tecum (199 miles, 320 km.) and Agades there are some rocky and sandy stretches, and the surface degenerates in the wet season. Much of the track is on clay, which cracks with heat. At 5.6 miles (9 km.) an old track, scarcely visible, leaves on the left and rejoins at 67 miles (108 km.). Shortly before Teguidda n'Tecum the new direct track to Agades branches left. The old track went through In Gall oasis; Tahoua is reached by taking this track and turning right at In Gall. At 249 miles (400 km.) a branch of the track leads to Iferouan; at 259 miles (417 km.) a track (left) goes to Teguidda n'Adrar, distance 3.7 miles (6 km.); and at 260 miles (420 km.) a track (right) leads to In Gall and Tahoua.

Water is obtainable as follows: at Fatakat (90 miles, 145 km.), well (1.2 miles, 2 km., on right); at In Abbangarit, excellent water at 13 feet; at Teguidda n'Tecum, bad water; at 232 miles (374 km.), pools; at Teguidda n'Adrar, good water at 50 feet; at Amachalouel, good water at 92 feet; and at Kourboubou (292 miles, 470 km.), good water at 56 feet.

Agades is a town with very good water, wireless, hotel, and garage.

4. THE DJOUF ROUTE

The Djouf route links southern Morocco with the French Soudan: it leaves the Mauritanian route (p. 327) between Tindouf and Ain ben Tili and continues southward through Bir el Ghzaim to el Mreiti, where the regularly used and improved route ends. South of el Mreiti the route is not regularly used and is difficult. It crosses the Djouf desert, passing through el Mrayer and Bou Dzib to Oualata and Néma, where tracks radiate over the district between the river Senegal and the upper Niger: one track, open in the dry season, leads to Bamako, whence there is road and rail communication to Dakar and St. Louis.

<i>Distances from Tindouf</i>	<i>Miles</i>	<i>Km.</i>
Bir el Ghzaim	251	404
El Mrayer	544	876
Oualata	962	1,548
Néma	1,033	1,662

South of Tindouf there are military posts with wireless and villages at Oualata and Néma. There is no water between el Mrayer and Bou Dzib, a distance of about 260 miles. The section between Oualata and Néma is relatively well supplied with water.



98. *Corrugated surface, track north of Arak*



99. *Cleared track, flanks of the Ahaggar, north of Tamanrasset*



100. *Hard sand, unmarked route, north of In Guezzam*



101. *Soft sand and track marked by boulders, south of In Guezzam*

5. THE SALT ROUTE

The Salt route—so called from the salt mines of Taoudenni, through which it passes—connects the Moroccan and western Algerian road systems through Ksar es Souk with the French Soudan and the river Niger at Timbuktu. The regularly used, improved, and good route from Ksar es Souk passes through Erfoud, south of which the track is rough and stony in places as far as Tabelbala; some engineering work has been done, including the building of a bridge across the Oued Ziz 8·7 miles (14 km.) short of Erfoud. Several tracks leave the route. Between Tabelbala and Bou Bernous much of the route is on reg, but there are bad patches of rock and sand. It is only roughly marked and in places difficult to find. Between Bou Bernous and Chegga there are long stretches of soft sand and numerous oueds are crossed: the ascent to Chegga is well engineered. The route continues to Taoudenni, making a long detour through Bir el Ghzaim (on Route 4); a direct route from Chegga through Oum el Asel was reported to be projected in 1937: the going is stony, and there is some difficult sand. Tracks leave this section for Tindouf and Ain ben Tili (for St. Louis).

South of Taoudenni the first 60 miles are fairly good over undulating reg, with some negotiable sand-dunes: the rest of the section is fair, with sandy and stony stretches.

The last section, from Araouane to Timbuktu, is fair and some of it excellent (over reg) for the first 90 miles (145 km.); after that the crossing of large dunes is sometimes difficult: the last part is fairly good, with sandy areas and patches of brushwood.

From Timbuktu a track leads eastward to Bourem and Gao and another westward.

<i>Distances from Ksar es Souk</i>	<i>Miles</i>	<i>Km.</i>
Erfoud	55	80
Tabelbala	298	479
Bou Bernous	512	824
Chegga	814	1,310
Taoudenni	1,408	2,267
Araouane	1,724	2,775
Timbuktu	1,942	3,125

Ksar es Souk is a native town with hospital, wireless, two hotels, and garage: there is a military post at Aoufous (32 miles, 52 km.). Erfoud has two hotels, a garage, and wireless. Tabelbala has a native village, oasis, military post, and wireless. Bou Bernous (Bordj Violletta) consists of a military post with wireless and water-point: food is scarce. At Chegga there is an oasis with a military post: food

is scarce. Taoudenni is a salt-mining centre with native village and water. The native village of Araouane has a military post with wireless. Timbuktu is a native town with a European quarter, a military post, and a hospital: it is a camel caravan centre. The town is linked to the river Niger by canal (high-level): when the river is low Kabara is the port for Timbuktu.

There is a waterless stretch of about 140 miles between Bou Bernous and Chenachane (about half-way between Bou Bernous and Chegga): water is available from a few wells along the sections of the route set out above.

6. THE AJJERS ROUTE

The Ajers route, some sections of which are very difficult, connects Algeria with Lake Chad through Ouargla, Fort Flatters, Amguid, Djanet, and Bilma to Fort Lamy. It leaves the road N. 3 at Biskra (p. 313) and follows the railway (p. 403) as far as Touggourt, the track being good, although sections are bad in the wet season. The route continues towards Ouargla, but stretches of it are poor, and some of the worst have been tarred; diversions for heavy traffic leave the main route. It turns south about 9 miles short of Ouargla, leaving the main track which, passing through Ouargla, joins Route 3 between Ghardaia and el Goléa (p. 334). The Ouargla-Fort Flatters track passes through Fort Lallemand and along the Gassi Touil (Vol. I, p. 72), a corridor of reg between dunes: about 9 miles short of Fort Flatters are cross-roads, 'les Quatre Chemins', with a track on the left forking later to Fort Polignac and Fort Saint, and tracks on the right to Amguid and Fort Flatters. This section from Ouargla lies through the sands of the eastern Erg and the Oued Igharghar (Vol. I, pp. 71-74); the most sandy parts have windbreaks. The track, marked by heaps of sand and stones, should always be followed, and not the wheel-tracks of motorists who have wandered off it.

The track from Fort Flatters to Amguid is mostly bad owing to soft sand: the crossing of the Oued Amguid is well engineered. A track leads to Fort Polignac via Tabelbalet. From Amguid to Djanet (Fort Charlet) the route passes through the foothills of the Tassili des Ajjer (Vol. I, pp. 78-79): several important tracks leave, for example, those leading to Tamanrasset at 2.5 miles (4 km.) and 239 miles (385 km.) out of Amguid; to Chirfa through In Afelalah at 281 miles (452 km.); to Fort Gardel and Fort Polignac (Route 7); to Ghat; and to In Ezzane and Chirfa (Route 7) at 367 miles (590 km.). Route 6 to Chirfa passes through In Afelalah and enters the Niger

Colony: it has sandy stretches. The route continues from Chirfa to Bilma and is sandy in places; it is marked by metal posts at intervals of 1·2 miles (2 km.), and one very sandy stretch has been paved with stones. Bilma lies in a region of dunes, and the track to Fort Lamy retraces the Chirfa-Bilma route as far as Séguédine, turns right, and runs eastward through sand and stones and across oueds approaching the Tibesti mountains at Zouar; this section before the war was little used and not well marked. From Zouar the track is good to Kichikichi, and beyond there are bad crossings of sandy oueds; brushwood becomes denser, and the southernmost part is difficult in the wet season. About 12 miles short of Kichikichi a track leaves the route for Faya (Largeau), Fada, and Abéché, and thence to el Fasher in the Anglo-Egyptian Sudan (Route 7).

<i>Distances from Biskra</i>	<i>Miles</i>	<i>Km.</i>
Touggourt	137	220
Ouargla	240	387
Fort Flatters	602	969
Amguid	792	1,275
Djanet	1,173	1,888
Chirfa. . . .	1,653	2,660
Bilma	1,858	2,991
Zouar	2,241	3,607
Fort Lamy	3,018	4,857

Part of the Biskra-Fort Lamy route in peace-time was used by the services of the C^{ie} Saharienne automobile:

Ouargla to Djanet, via Fort Polignac (October-May, bi-monthly; June-September, monthly).

Touggourt to Ouargla (October-May thrice weekly, June-September, twice weekly).

Biskra, Touggourt, and Ouargla are described in the gazetteer (pp. 61, 112, 93, respectively); other centres of importance are as follows:

Fort Lallemand: military post, wireless, food scarce, water abundant.

Fort Flatters; military post, native village, wireless, water abundant.

Amguid: military post, wireless, excellent water.

Djanet: military post (Fort Charlet), wireless, garage, drinking-water.

Chirfa: military post, native village, wireless.

Bilma: native village, oasis, wireless.

Zouar: military post, native village, wireless, water.

Fort Lamy: European and native towns, hotel, hospital, drinking-water.

Water is also available from a few wells along the sections of the route set out above.

7. THE EASTERN ERG AND TIBESTI ROUTE

The eastern Erg and Tibesti route connects the road systems of Tunisia and Tripolitania with those of French Equatorial Africa and the Anglo-Egyptian Sudan: it consists of a road running southward from Médenine to Fort Saint, and another from Tripoli to Ghadames, these two then passing into Algerian territory at Fort Messaouda. Here they join in a track which branches, one part going south-west to Fort Flatters (meeting Route 6), and the other passing southward to Fort Polignac, Fort Gardel, and thence to In Ezzane, to meet Route 6 again at Chirfa. Thence it follows Route 6 through Zouar and branches south-eastward, 12 miles short of Kichikichi, for Faya (Largeau), Fada, Abéché, and thence to el Fasher (Anglo-Egyptian Sudan). From el Fasher the main route runs to el Obeid, where it joins the Sudan railway. Tracks leading from this route cover Darfur and Kordofan, and spread thence to the Nile valley, to Omdurman and Khartoum, and the Anglo-Egyptian Sudan as a whole.

The section from Fort Saint and Ghadames to Fort Polignac crosses difficult soft sand, sandy oueds, and stony depressions. The track from Fort Polignac via Fort Gardel has some rocky stretches, steep gradients, and narrow passages; some engineering work has been done. Route 7 from Djanet through In Ezzane to Chirfa is steep, difficult, and sandy. The section from Zouar to Abéché is engineered across a reg plain with sandy oued crossings to Faya; it then has some heavy going over sand to Fada and continues to Abéché. All the places mentioned in this paragraph are military posts, most of them with wireless and water. Information as to other facilities along this route is not available for publication. Water is available along the route at fairly numerous points, most of it good.

Distances from Médenine

From Tripoli

	<i>Miles</i>	<i>Km.</i>		<i>Miles</i>	<i>Km.</i>
Ghadames. . .	266	428		415	668
Fort Polignac . .	618	995		767	1,235
Djanet . . .	978	1,574		1,127	1,814
Chirfa . . .	1,352	2,177		1,502	2,417
Bilma . . .	1,558	2,508		1,707	2,748
Zouar . . .	1,941	3,124		2,090	3,364
Faya (Largeau) . .	2,305	3,710		2,454	3,950
Fada . . .	2,493	4,012		2,642	4,252
Abéché . . .	2,784	4,480		2,934	4,720

CHAPTER XVI

RAILWAYS

ALGERIA has a railway network of more than 3,000 miles. Of this total about 1,380 miles are of the normal gauge (1.435 m., 4 ft. 8½ in.) and some 1,700 miles are of the 1.055 m. (3 ft. 5½ in.) and 1.00 m. (3 ft. 3⅜ in.) gauges. West of Algiers all narrow-gauge lines are 1.055 m., and east of Algiers 1.00 m. The network serves a very small proportion of the total area of the country, but about nine-tenths is highland or desert, in which railway construction is difficult or impossible.

The absence of navigable rivers and the heavy gradients of many of the roads rendered the construction of railways of prime importance for the proper development of the country. The building of this extensive system of railways has involved considerable engineering problems owing to the physical characteristics of the country. These difficulties have been increased by the necessity of adjusting the conflicting claims of the different ports for railway links with the interior without sufficient regard to the engineering problems involved in meeting their respective claims. From the topographical point of view Algeria presented a series of interesting problems for the engineer, which could best be solved by following the natural routes through the country. This course has, unfortunately, been ignored in a number of instances, so that both the cost of construction and the working expenses have been unduly increased. The extensions southward into the Sahara were necessary for military reasons. The system, considered as a whole, is composed of lines parallel with the coast and lines at right angles to it.

HISTORY

The building of railways in Algeria goes back many years and may be divided into five distinct periods. The first includes the programme of 1857 and the gradual extension of the railways until the year 1877. The second period is marked by the striking activity in railway construction between the years 1877 and 1890. This was followed by a few years of comparative stagnation, during which many of the existing railways failed to pay their way until the State, in the interests of the country, was obliged to buy and operate certain of the systems. The fourth period, that of reform, began by the State

acquiring the management of certain railways in 1900 and purchasing them in 1903; it is characterized by the separation of the Algerian budget from that of metropolitan France in 1900 and by the decentralization of the railway administration at the end of 1904. The Algerian Government also embarked upon a new programme of railway construction, which involved particularly the extension of railways southward, the linking-up of existing lines of communication, and the construction of railways to some of the smaller ports. During the most recent period the separate companies operating in Algeria have been amalgamated, culminating in the complete state control of the railways since 1939.

The first proposals for the building of railways in Algeria were put forward by private enterprises between 1844 and 1854, when the following lines were suggested: Algiers to Blida, Philippeville or Stora to Constantine, Mostaganem to l'Hillil, and Oran to Tlemcen. The programme of 1857, embodied in a decree issued on 8 April by Marshal Vaillant, the Minister of War, through the Governor-General, Marshal Randon, was a carefully considered scheme of railway construction throughout the country. The decree stated that:

'There will be created in Algeria a railway system embracing the three provinces and including (1) a line parallel to the sea, running from Algiers to Constantine, through or near Aumale and Sétif, and from Algiers to Oran through or near Blida, Orléansville, St. Denis du Sig, and Ste. Barbe du Tlélat; (2) lines from the principal ports to the railway parallel to the sea, viz. from Philippeville to Constantine, from Bougie to Sétif, from Bône to Constantine via Guelma, from Ténès to Orléansville, from Arzeu and Mostaganem to Relizane, and from Oran to Tlemcen via Ste. Barbe du Tlélat and Sidi bel Abbès.'

At subsequent periods the scheme was modified (not always with the best results), but substantially it was executed in the manner at first conceived, and was virtually completed by 1886.

The route of the west-east railway was arranged so as to run near, but not through, some of the principal ports. As a through route, therefore, the railway may be considered to have an independent existence. The closest approach to the sea is near Algiers, where the line passes through the junction of Maison Carrée, only 7 miles from the capital.

By 1886 the system had been extended to Tunis, and the lines of penetration had crossed the west-east railway and were being extended southward. A number of lines provided for by a new

programme issued on 18 July 1879 had already been authorized or conceded. This comprised the building of some 1,890 miles (3,041 km.) of lines; but in the course of execution it was modified by changes of route, postponement of certain lines, and the building of railways for which provision was not then made.

The system slowly developed until 1877, when the length executed was 319 miles (513 km.). During the succeeding years, until 1890, more than 124 miles (200 km.) per annum were constructed, and in 1890 the length of railways completed was 1,750 miles (2,816 km.). By 1902 this had grown to 1,870 miles (3,000 km.). Shortly before the War of 1914-1918 an extensive programme of subsidiary railways, including important lines of penetration southward, was under consideration, and certain other railways were being constructed. In 1937 the operated mileage of the Algerian State Railways (*Chemins de fer Algériens*) was 3,104 miles (4,995 km.), though this figure has since fallen owing to the closing of certain lines (cf. p. 349) which could not be worked profitably.

ORGANIZATION

Administration

The construction of the Algerian railway system has been due to the activities of different companies supported generally by financial guarantees offered by the State (p. 286). Prior to the period of reform instituted in 1900 the system was controlled by five different companies whose interests did not always coincide with those of the whole country. These companies were the Ouest-Algérien, the Franco-Algérienne, the Paris-Lyon-Méditerranée, the Est-Algérien, and the Bône-Guelma, and they owned the through route from west to east. The lines belonging to the C^{1e} Franco-Algérienne and the C^{1e} de l'Est-Algérien were bought by the State in 1903 and 1908 respectively, and the Bône-Guelma lines about ten years later. Up to 1933 the railways in Algeria were managed by two separate undertakings, the *Chemins de fer Algériens de l'État* (C.F.A.E.) and the Paris-Lyon-Méditerranée (P.L.M.) company of France. The former comprised a network of lines radiating from Bône and covering the area between Algiers and the Tunisian frontier, together with a smaller group of lines around Oran which extended inland to Kenadza. It consisted of the networks of the former Est-Algérien, Bône-Guelma, and Franco-Algérienne companies, which afterwards became the *État Algérien*, and included 2,260 miles (3,631 km.) of line. The lines owned and managed by the P.L.M. French railways—the

result of the fusion of the P.L.M. Algérien and the Ouest-Algérien (excluding the Philippeville–Constantine line given over in 1922 to the C.F.A.E.)—covered 800 miles (1,287 km.), of which 530 miles (853 km.) were normal gauge, and 270 miles (433 km.) were narrow (1.055 m.) gauge.

In 1933 these two networks were merged under a joint administration named the Chemins de fer Algériens (C.F.A.); all departments of both are controlled by the new management. On 1 January 1939 a special department called the Administration des chemins de fer Algériens took over the control of the whole Algerian railway system. This department operates under the authority of the Governor-General as a part of the Civil Service and enjoys financial autonomy.

During the last twenty years there has been much improvement in the railways, but even greater progress might have been made had funds been available. Enthusiastic programmes were formulated, but only a small proportion of the necessary expenditure was granted. Many French railwaymen were incorporated in the personnel, and under their able direction the railways have been transformed from somewhat primitive lines to a system approximating to western European standards. Operating methods are generally efficient, and the permanent way and rolling-stock are in a fairly good state of repair; there are, however, insufficient locomotives, carriages, and wagons, and station installations are often out of date and in bad repair.

Among the many improvements that have been effected are the introduction of a signalling and dispatching system similar to that in use on the railways of France, the replacing and renewing of bridges and portions of the lines, the improvement and increase in the number of workshops and depots, and the improvement of the water-supply. Besides these, the line from Bône to Souk Ahras and Oued Kébérit has been electrified.

Personnel (1938)

	<i>Employed on lines of</i>		
	<i>normal gauge</i>	<i>narrow gauge</i>	<i>Total</i>
Head offices . . . . .	..	..	280
District offices . . . . .	..	..	1,728
Maintenance of way and works .	1,937	2,579	4,516
Station staff	3,638	1,291	4,929
Train staff	595	359	954
Locomotive running staff . . .	1,025	307	1,332
Shed staff.	2,160	580	2,740
Workshops	1,817	596	2,413
Various	113	31	144
Total staff . . . . .	..	..	19,036

Route Length and Gauges

<i>Normal gauge (1·435 m.; 4 ft. 8½ in.)</i>					<i>km.</i>
Single-track, steam operated	.	.	.	.	1,917
Double-track, steam operated	.	.	.	.	149
Single-track, electrified	.	.	.	.	165
					<hr/> 2,231
<i>Narrow gauges</i>					
1·055 m. (3 ft. 5½ in.)	.	.	.	.	1,992
1·00 m. (3 ft. 3⅜ in.)	.	.	.	.	772
					<hr/> 2,764
Total, normal and narrow	.	.	.	.	4,995

Permanent Way

Rails. Type: Vignole, flat-bottomed.

Weight: normal gauge, 46·02 kg. per metre.
 narrow gauges, 36·50 kg. per metre.
 Oran-Kenadza line, 25·00 kg. per metre.

Length: normal gauge, old rails, 12 metres.
 new rails, 24 metres.

Rail Fastening. For wood and concrete sleepers: coach screws.
 For steel sleepers: bolts and clips.

Fishplates. Angle fishplates.

Sleepers. Type: wood, steel, and reinforced concrete (Vagneux type). The concrete sleepers were under trial in 1936 and proved satisfactory. Steel sleepers of 80 kg. are gradually replacing those of 68 to 70 kg. Spacing: 36 per 24-metre rail length.

Ballast. Type: broken stone in sizes of 40 to 50 mm. Height of bottom of rail above formation: 40 cm.

Maximum Permissible Axle Loads (in tons)

Oran-Oudjda	.	.	.	.	13½
Oran-Algiers	.	.	.	.	18½
Ménerville-Constantine	.	.	.	.	20
Duvivier-Oued Kéberit	.	.	.	.	20
Souk Ahras-Ghardimaou	.	.	.	.	13

*Curvature and Gradients**Length of Straight and Curved Track*

	<i>Curved track</i>					
	<i>Straight track</i>		<i>Curves of 500 m. radius or more</i>		<i>Curves of less than 500 m. radius</i>	<i>Total</i>
	<i>Km.</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>Km.</i>	<i>%</i>
Normal gauge	1,437	66.0	17.1	16.9	739	34.0
Narrow gauges	2,064	74.4	9.3	16.3	710	25.6
Total	3,501	70.7	12.7	16.6	1,449	29.3

The minimum radius of curves on normal-gauge lines is between 200 metres and 300 metres, and on narrow-gauge lines is 100 metres.

Length of Lines on Gradients

<i>Gradients of</i>	<i>Up to 5‰ (1 in 200)</i>	<i>5 to 10‰ (1 in 100)</i>	<i>10 to 25‰ (1 in 40)</i>	<i>More than 25‰</i>	<i>Total</i>	
					<i>km.</i>	<i>%</i>
Normal gauge	20.4	25.6	32.0	0.2	1,701	78.2
Narrow gauges	33.0	20.4	27.5	1.1	2,275	82.0
Total	27.4	22.7	29.5	0.7	3,976	80.3

Gradients do not appear to be compensated for curvature.

Signalling and Safety Regulations

Signalling in general follows French practice, both semaphore and disk being used. Separate block communication circuits are installed on certain sections.

A train dispatching system is in operation on the following sections:

Oudjda-Tlemcen	Constantine-Souk Ahras
Tlemcen-Oran	Constantine-Philippeville
Oran-Algiers	Bône-Oued Kébérît
Algiers-Constantine	

Electrically operated Railways

Section electrified: Bône-Oued Kébérît (102 miles, 163 km.).

This is the only electrified section of the Algerian railways. The conversion was undertaken to deal with the very heavy iron-ore traffic from the mines of Djebel Ouenza (near Oued Kébérît) (p. 241), and with the phosphate traffic from Tébessa (the terminus of the narrow-gauge steam-operated extension south from Oued Kébérît) (p. 247).

Source and Nature of Electric Power. Power is generated at Bône steam-power station, normally working on imported coal (p. 250). The station is equipped with four groups of generators of 10,500 kVA. The line is worked on 3,000 volts D.C.

Sub-stations (cf. Fig. 67).

Bône

Medjez Sfa (6 miles south-east of Duvivier)

Souk Ahras

Oued Damous (8 miles north-west of Oued Kébérit)

The Bône sub-station is equipped with mercury-arc rectifiers. The other sub-stations transform the 90-kV. current into 3-phase current of 5,000 volts and then into D.C. of 3,000 volts. The Souk Ahras sub-station has three groups of converters each of 2,500 kW.; Medjez Sfa and Oued Damous each have two groups of 2,500 kW. All the sub-stations are automatically controlled.

Method of Current Collection. The overhead equipment consists of a carrying cable with cross-sectional area of 79 sq. mm. (0.122 sq. in.) and two copper contact wires, each with cross-sectional area of 107 sq. mm. (0.166 sq. in.).

The pylons are built of twin angle sections or broad flanged beams, and carry, besides the contact line, the aluminium feeding wires.

Fuel

Steam locomotives normally burn a mixture of Welsh steam coal and briquettes, as in France. Briquettes are imported or are made from a mixture of Kenadza or Djerada coal, Welsh or Turkish smalls, and imported pitch. In 1938 the total consumption was 150,000 tons of coal and 87,000 tons of briquettes. Since 1940 coal from the mines of Kenadza (p. 250) and Djerada (French Morocco) has been supplemented by local supplies of wood and alfa (esparto grass).

Water-supply

Natural water-supply is of poor quality, and purification on a large scale has had to be undertaken. Numerous modern water-columns and water-softening installations have been fitted during recent years in place of the primitive apparatus previously in use, so that the supply and quality of water are satisfactory for present requirements and occasional increases of traffic. The type of water-column in use is similar to that on French main lines.

Locomotives (1940)

Steam locomotives . . .	640 (all gauges)
Electric locomotives . . .	30 „ „
Diesel electric locomotives . . .	2 „ „
Rail motors	20 „ „

The Beyer-Garratt articulated locomotives (4-8-2: 2-8-4, narrow gauge, and 4-6-2: 2-6-4, normal gauge) were specially designed to haul trains of 400 tons gross over the heavy gradients in Algeria.

The electric locomotives are very similar in their electrical equipment to those used on the 1,500-volt lines of the south-western region of the French National Railways. They can haul trains of 840 tons from Oued Kéberit to Duvivier, with the help of a banking engine over the 7 miles (11 km.) of 1 in 40 gradient near Souk Ahras.

Workshops

The principal locomotive workshops are at Algiers for all gauges (mainly normal), Sidi Mabrouk (Constantine) for normal and 1.00-m. gauges, and Oran for normal and 1.055-m. gauges. There are mixed repair shops for locomotives, carriages, and wagons of 1.055-m. gauge at Perrégaux. The electric locomotive shops are at Souk Ahras. There are rolling-stock repair works at Sidi bel Abbès and Bône.

Carriages and Wagons (1938)

	Normal gauge	Narrow gauges
Passenger vehicles { Coaches	481	315
{ Baggage vans	315	174
Total	796	489
Goods vehicles { C.F.A. wagons	7,630	4,256
{ Private wagons	693	33
Total	8,323	4,289

Braking Equipment

The Westinghouse compressed-air brake is used for passenger and fast goods traffic. Hand brakes, both screw and lever, are used on ordinary goods wagons. Willison automatic couplers are employed throughout.

Couplings

Normal-gauge and 1.055-m. gauge vehicles have side buffers and centre couplings: 1.00-m. gauge vehicles have centre buffers and couplings.

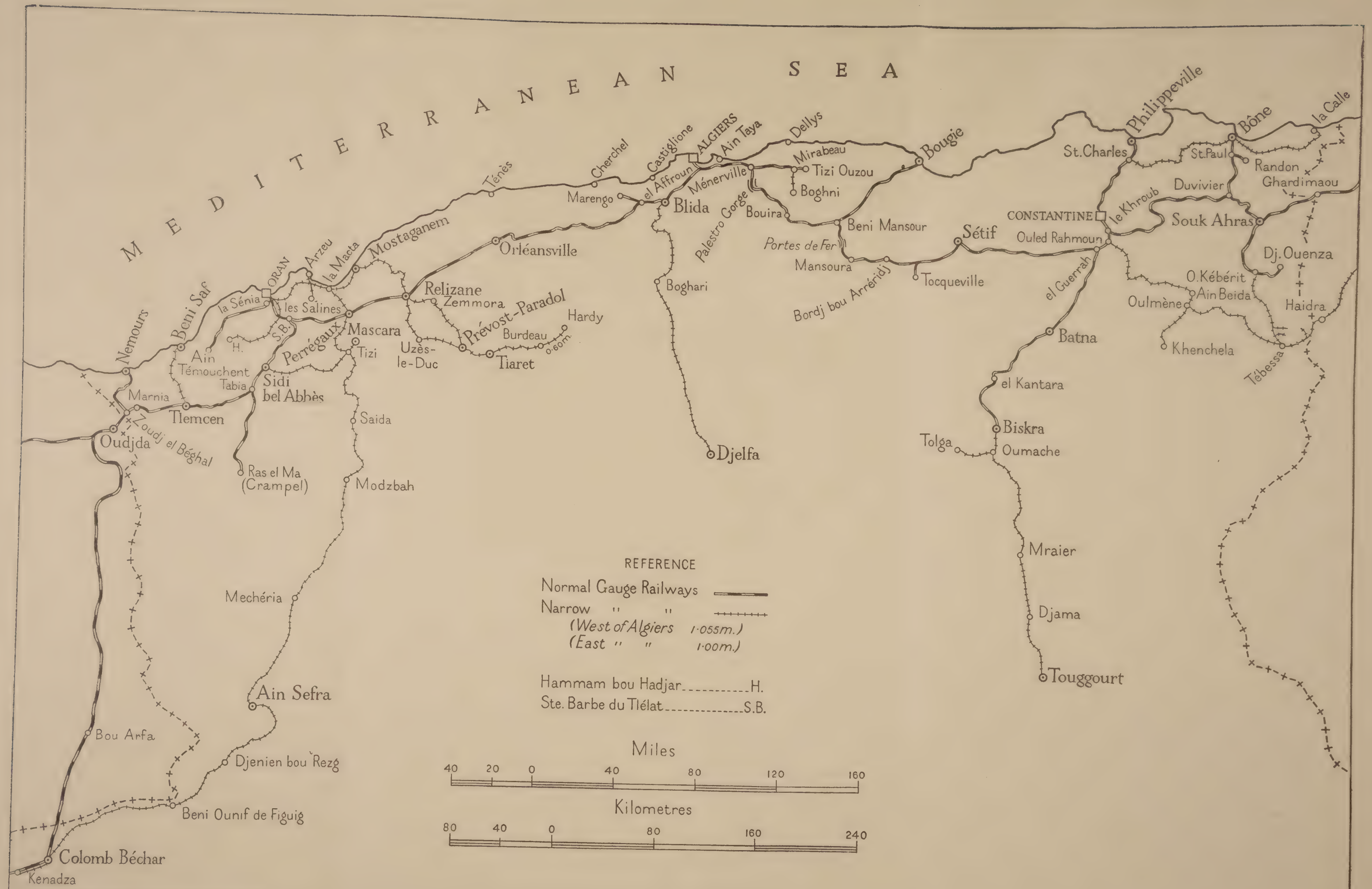


FIG. 75. The railways of Algeria

Speed of Trains

The average speed of goods and military trains is $12\frac{1}{2}$ – $15\frac{1}{2}$ miles (20–25 km.) per hour. The speed of passenger trains varies on different lines; some examples are given below.

	<i>Distance</i> km.	<i>Time</i> hrs. min.	<i>Speed</i> km. per hr.
Oran–Algiers . . .	422	6 45	62 (39 m.p.h.)
Colomb Béchar–Oran . . .	749	20 48	36 (22 „)
Bône–Algiers . . .	651	12 48	51 (32 „)
Constantine–Algiers . . .	464	8 23	55 (34 „)
Constantine–Biskra . . .	240	4 55	49 (30 „)
Bône–Constantine . . .	219	4 46	46 (29 „)
Oudjda–Oran . . .	253	5 44	44 (27 „)
Biskra–Touggourt . . .	217	5 18	41 (25 „)
Djelfa–Blida . . .	279	7 16	39 (24 „)

At certain points on the Oran–Algiers line $74\frac{1}{2}$ miles (120 km.) per hour (the highest speed in Africa) is attained.

Capacity

On the normal-gauge system the capacity of the single-track steam-operated lines can be taken as ten trains per day in each direction. The capacity of the double-tracked sections and of the electrified line from Bône to Oued Kéberit is about three times that of the single-track steam-operated sections. All the lines cannot be used to capacity at any one time, owing to the limited quantity of locomotives and rolling-stock. Normal gross loads of trains are about 400 tons (840 tons on the electrified section).

New Works

The only line at present under construction is the trans-Saharan or Mediterranean–Niger normal-gauge extension of the Oudjda–Bou Arfa–Colomb Béchar line which will connect the railway system of French North Africa with that of French West Africa. The proposed route is Beni Abbès, Adrar, and In Tassit, whence two branches will connect with the railways of Senegal and the river Niger. Reference to the present state of this line is made in Appendix D.

Closed Lines

Several narrow-gauge lines have been closed during the last few years, largely owing to uneconomical working and, in the case of those near Algiers, to the competition of road transport. Specific details are, however, lacking, and these lines have, therefore, been omitted. The following lines are known to have been closed:

Bouira–Aumale; Algiers–Koléa with branch to Castiglione; Algiers–Rovigo with branch to Ain Taya; Mirabeau–Dellys; Marengo–Cherchel; and Orléansville–Ténès.

DETAILED DESCRIPTION OF RAILWAYS

ITINERARIES of the most important lines in the country are given below. Detailed information for some of the lines is not available for publication. The plan adopted in describing the lines is to take the chief ports as the main centres and, as far as possible, to describe the routes from the ports inland. The lines centred on Oran and those between Oran and the Moroccan frontier are described first, together with branch lines; the next section deals with the line between Oran and Algiers and its branches, as well as other lines in the region; the third section includes the line from Algiers to the Tunisian frontier and all lines in this region. Branch lines are given at the beginning of each main line, and are described in detail either incidentally in the itineraries or, if they are long, after the main line. Lines operated entirely for mineral workings (usually on very narrow gauge) have in general been omitted.

All the lines described in the text are shown in Fig. 75. They are also shown in relation to other means of communication on the map in the pocket at the end of the book.

Moroccan Frontier to Oran

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1. ORAN–OUDJDA (FRENCH MOROCCO)	351
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Oran to Algiers

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*Algiers to Tunisian Frontier**Page*

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<i>Branch:</i> ST. PAUL—RANDON	414
20. BÔNE—LA CALLE	415
21. SOUK AHRAS—TÉBESSA—HAIDRA (TUNISIA)	416
<i>Branch:</i> OUED KÉBÉRIT—DJEBEL OUENZA	419

1. ORAN—OUDJDA (FRENCH MOROCCO)

(Photos. 62, 63, 102, 103)

Length

Oran—Sidi bel Abbès	48.4 miles	78.1 kilometres
Sidi bel Abbès—Tlemcen	54.4 „	87.1 „
Tlemcen—Oudjda	53.8 „	86.2 „
	<hr/> 156.6	<hr/> 251.4

Branch lines

The line to Ain Témouchent (Route 2) leaves at la Sénia, mile 6.5 (km. 10.5); that to Algiers (Route 7) at Ste. Barbe du Tlélat, mile 19 (km. 31); that to Tizi, narrow gauge, at Sidi bel Abbès, mile 48 (km. 78); that to Ras el Ma (Crampel) (Route 3) at Tabia, mile 63 (km. 101); that to Beni Saf, narrow gauge (Route 5), at Tlemcen, mile 103 (km. 165); and that to Nemours (Route 6) at Zoudj el Béghal, mile 145 (km. 234).

Traction

Steam.

Permanent way

Gauge: normal (1.435 m.). Double track: Oran to Ste. Barbe du Tlélat; single track: Ste. Barbe du Tlélat to Oudjda. Maximum axle load, 13½ tons. Minimum radius of curves, 400 m. Maximum up gradient, 1 in 53 Oran—Oudjda, 1 in 60 Oudjda—Oran. Maximum distance between stations, 17.3 km. (10¾ miles) Zoudj el Béghal—Oudjda. Minimum length of loop lines at stations, 280 m.

Speed and capacity

Overall time (including stops): passenger trains, 5 hrs. 45 min. Capacity of line, 12 trains per day each way.

Miscellaneous

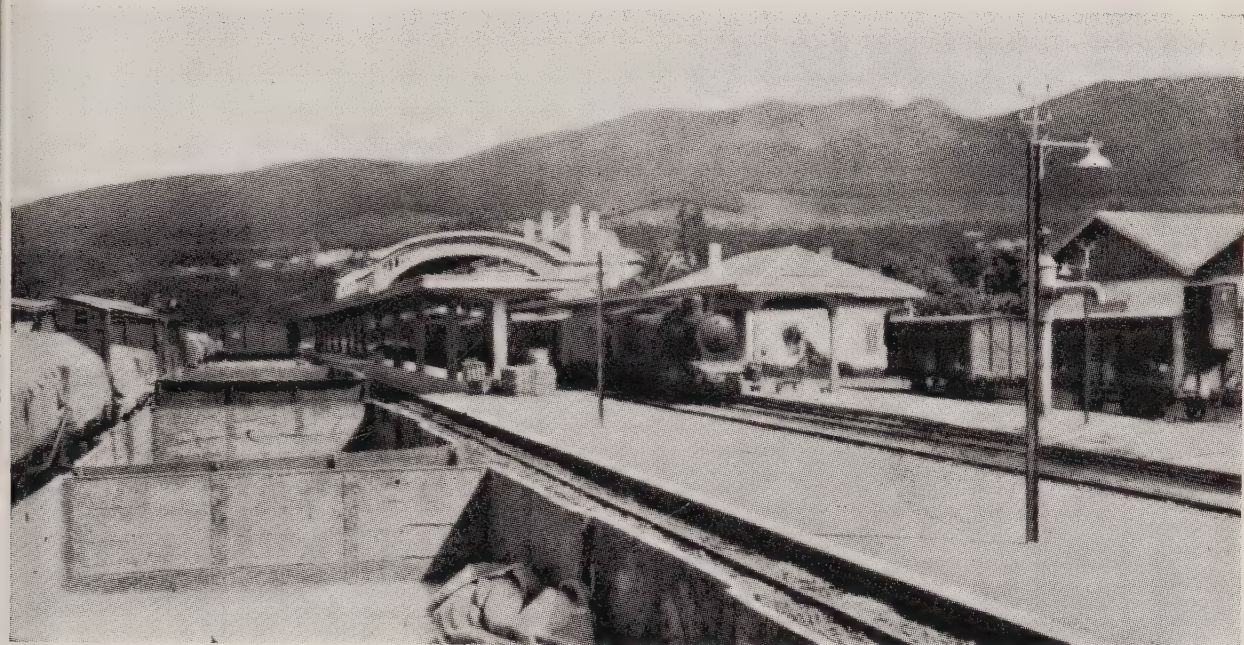
Marshalling yards at Oran (Marine), la Sénia, Sidi bel Abbès, and Oudjda. Locomotive repair shops at Oran. Engine sheds at Oran, Sidi bel Abbès, Tlemcen, and Oudjda.

GENERAL DESCRIPTION

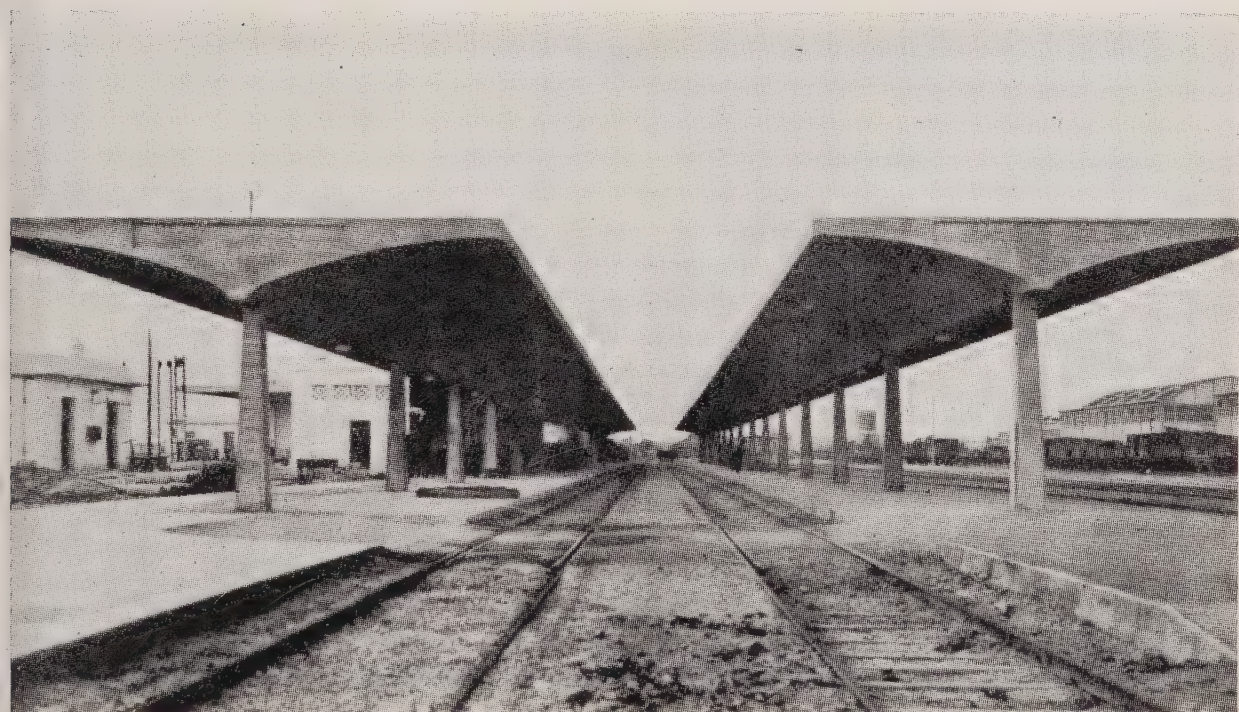
This line crosses a mountainous region, rising to a height of 2,840 feet. It leaves the main Algiers line at Ste. Barbe du Tlélat, and following a general south-westerly direction soon leaves the plain and rises into an undulating region. It ascends the valley of the Oued Tlélat, following the lower slopes of Djebel Tafaraoui, part of the Monts du Tessala. The line crosses numerous ridges and follows the Oued Mékerra as far as Tabia. From here it turns south-westward across hilly country to reach the Isser valley at Lamoricière: it then crosses numerous streams and passes through many tunnels and cuttings. The line follows the northern edge of the Monts de Tlemcen, and there are many rivers rising in this highland and flowing northward. There were few engineering difficulties on this line except in the section between Lamoricière and Tlemcen: one of the most difficult obstacles was the ravine cut by the Oued Safsaf at el Ourit, 4 miles south-east of Tlemcen. In the section between Ain Fezza (155.5 km.) and Tlemcen (165.2 km.) there are five tunnels and two bridges, and the line makes a very large bend to cross the Safsaf. From Tlemcen the line continues generally westward, crossing the Oued Tafna, and descending steeply to Marnia (Lalla Maghnia) with several sharp bends. This last section is through difficult country, and there are again numerous tunnels. At Zoudj el Béghal the Moroccan frontier is reached, and the line then crosses the Angad plain to Oudjda.

DETAILED DESCRIPTION

<i>Distance in km. from Oran (Marine)</i>		<i>Stations</i>	<i>Remarks</i>
0.0	ORAN (MARINE)	Alt. 6 ft. (2 m.). Quay facilities limited. Marshalling yard (c. 12 sidings) behind Bassin Aucour. Watering facilities (electric pump; public supply). Narrow-gauge wagons travel	



102. *Tlemcen station (Route 1)*



103. *Sidi bel Abbès station (Route 1)*



104. *Sidings on quayside, Bab el Oued, Algiers*



105. *Sidings at foot of Rampe Chasseloup Laubat, north of Gare Centrale, Algiers*

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
		between Oran (Marine) and Oran (Ville) on special normal-gauge trucks.
		Line ascends with gradients of 1 in 50 and 1 in 33, running eastward along the quaysides passing through a short tunnel, and then turning west to Oran (Ville).
4.4	ORAN (VILLE)	Alt. 364 ft. (111 m.). Goods and passenger station. Watering facilities (electric pump; public supply). Engine shed. Turntable (23 m.). Locomotive workshops (normal and 1.055-m. gauges) at c. 6 km.
5.1	..	Bridge (15 m.), metal, over narrow-gauge line to Kenadza.
10.5	LA SÉNIA	Alt. 295 ft. (90 m.). Turntable (23 m.). Marshalling yard. Junction for line to Ain Témouchent (Route 2).
		Line crosses plain of Figuier to eastern end of Sebkhah depression (Photo. 63).
14.7	VALMY	Alt. 302 ft. (92 m.). 1 siding (580 m.).
		Line skirts eastern end of Sebkhah d'Oran.
22.5	ARBAL	Alt. 328 ft. (100 m.). 1 siding (600 m.).
		Line crosses Tlélat plain east of Monts du Tessala.
30.9	STE. BARBE DU TLÉLAT	Alt. 456 ft. (139 m.). Watering facilities (electric pump). Turntable (14 m.). 1 loop line (465 m.). 1 siding (360 m.). Junction with main Oran-Algiers line (Route 7).
		Line follows Tlélat valley into mountainous country.
32.1	ST. LUCIEN	Alt. 659 ft. (201 m.). Watering facilities (public supply). 1 loop line (499 m.). Line enters narrow gorge of Oued Tlélat.
41.9	LAURIERS ROSES	Alt. 1,191 ft. (363 m.). Watering facilities (motor pump; well). 1 loop line (502 m.). Ascends Col des Ouled Ali.
54.8	OUED IMBERT	Alt. 1,578 ft. (481 m.). Watering facilities (steam pump). 1 loop line (450 m.).
62.4	LES TREMBLES	Alt. 1,289 ft. (393 m.). 1 loop line (500 m.).
		Line enters Oued Mékerra valley, which it follows across Bel Abbès plain.
67.8	PRUDON (SIDI BRAHIM)	Alt. 1,427 ft. (435 m.). 1 loop line (480 m.).
78.1	SIDI BEL ABBÈS	Alt. 1,585 ft. (483 m.). Passenger station (3 through tracks) (Photo. 103). Goods station (6 dead-end sidings) with 2 goods sheds. Marshalling yard (5 double-ended tracks, c. 622 m., opening into 4 short loop lines). Watering facilities (electric pump; public supply). Turntable (17 m.). Engine shed. Coaling yard. Carriage and wagon repair-shops for normal-

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
		gauge stock (5 main shops, 14 tracks). Good road access to goods station. Junction for narrow-gauge line to Tizi (48 miles, 78 km.) and Mascara (56 miles, 90 km.). (No details of this line available for publication.)
80.1	..	Bridge over Oued Mékerra (12 m.), metal.
84.2	DÉTRIE (SIDI LHASSEN)	Alt. 1,640 ft. (500 m.). 1 loop line (500 m.).
86.4	..	Bridge over Oued Mékerra (14 m.), metal.
87.3	..	Bridge (15 m.), metal.
90.3	PALISSY (SIDI KHALED)	Alt. 1,736 ft. (529 m.). 1 siding (335 m.). 1 loop line (490 m.).
97.1	BOUKANÉFIS	Alt. 1,923 ft. (586 m.). 1 siding (250 m.). 1 loop line (550 m.).
101.4	TABIA	Alt. 2,047 ft. (624 m.). Watering facilities (steam pump). 1 siding (300 m.). 1 loop line (410 m.). Junction with line to Ras el Ma (Crampel) (Route 3). Line follows northern edge of Monts de Tlemcen.
114.1	TAFFAMIN-TASSIN	Alt. 2,234 ft. (681 m.). 1 loop line (500 m.).
120.5	DESCARTES	Alt. 2,434 ft. (742 m.). 1 loop line (550 m.).
124.8	AIN TELLOUT	Alt. 2,392 ft. (729 m.). 1 loop line (550 m.).
125.0	..	Viaduct over Oued Tellout, arches 8 × 10 m.
130.4	..	Skew bridge over Oued el Gliaa.
133.5	LAMORICIÈRE	Alt. 2,346 ft. (715 m.). Watering facilities (electric pump). 1 siding (340 m.). 1 loop line (550 m.).
133.9	..	Bridge over Oued Isser (30 m.), metal.
144.2	..	Bridge over Chabet el Kébir (c. 72 m.), 3 spans, metal.
144.5	OUED CHOULY	Alt. 2,408 ft. (734 m.). 1 loop line (315 m.).
145.0	..	Viaduct over Oued Chouly, arches 3 × 18 m., stone. Several deep cuttings and 3 small bridges.
155.5	AIN FEZZA	Alt. 2,821 ft. (860 m.). 1 loop line (500 m.).
157.1	..	Tunnel (239 m.).
157.5	..	Tunnel (130 m.).
158.7	..	Tunnel (118 m.).
159.3	..	Bridge (25 m.), metal.
159.4	..	Tunnel (213 m.).
159.7	..	Bridge over Oued Safsaf (68 m.), steel 3-hinged arch in el Ourit gorge (Photo. 62).
159.8	..	Tunnel (666 m.).
164.6	..	Bridge over small stream.
165.2	TLEMCCEN	Alt. 2,526 ft. (770 m.). Watering facilities (public supply; well). Engine shed. 2 turntables (14 m. and 4.4 m.). 1 loop line (507 m.). Sidings. Junction with line (narrow gauge) to Beni Saf (Route 5) (Photo. 102). Between here and Marnia line descends steeply and contains numerous sharp, reverse curves.

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
169.7	MANSOURA	Alt. 2,641 ft. (805 m.). 1 loop line (280 m.). 3 small bridges at km. 170, 170.4, 170.9.
174.6	..	Tunnel (423 m.).
175.2	..	Tunnel (190 m.).
177.0	AIN DOUZ	Alt. 2,697 ft. (822 m.). Halt. No stop signals.
180.3	ZELBOUN	Alt. 2,628 ft. (801 m.). Watering facilities (well). 1 loop line (450 m.).
182.7	..	Tunnel (318 m.).
189.1	..	Tunnel (242 m.).
191.9	..	Viaduct over Oued el Atchane (110 m.), 3 spans, stone.
194.7	TURENNE	Alt. 2,024 ft. (617 m.). Watering facilities (well). 1 loop line (370 m.).
c. 202.0	..	Viaduct over Oued Ksab (117 m.), arches 6 × 15 m., stone. 33 m. (109 ft.) above the river.
c. 203.0	..	Tunnel (203 m.).
208.1	..	Tunnel (215 m.).
208.5	..	Tunnel (200 m.).
c. 210.0	..	Viaduct over Oued Tafna (145 m.).
210.3	..	Tunnel (96 m.).
210.8	SIDI MEDJAHED	Alt. 1,358 ft. (414 m.). 1 loop line (450 m.).
211.3	..	Viaduct over Oued Ouame (117 m.), 3 spans.
212.8	..	Tunnel (350 m.).
214.0	..	Viaduct over Oued Tralimet (182 m.), 4 spans.
215.5	TRALIMET	Alt. 1,480 ft. (451 m.). Halt. No stop signals. Line descends to plain of Marnia with several sharp bends. 3 short bridges at km. 217.4, 219.5, 223.1.
224.4	MARNIA (LALLA MAGHNIA)	Alt. 1,227 ft. (374 m.). Watering facilities (motor pump). Turntable (14 m.). 1 loop line (400 m.). 1 siding (200 m.).
c. 224.7	..	Viaduct over Oued el Afounia (35 m.), stone. Bridges over 2 small streams at km. 230.2, 231.3.
234.1	ZOUDJ EL BÉGHAL	Alt. 1,457 ft. (444 m.). Watering facilities (motor pump). 1 loop line (500 m.). Junction with line to Nemours (Route 6). Frontier. Moroccan railway system begins. Line enters Angad plain.
235.7	..	Bridge over Oued Mehagnene (28 m.), metal.
251.4	OUJDJA (FRENCH MOROCCO)	Alt. 1,785 ft. (544 m.). Engine shed. Marshalling yard (over 25 sidings of 275-450 m. each). Triangle. Junction with line to Bou Arfa (French Morocco).

2. ORAN-AIN TÉMOUCHENT

(Photo. 63)

Length

47·3 miles, 75·7 kilometres.

Traction

Steam.

Permanent way

Gauge: normal (1·435 m.). Double track: Oran-la Sénia; single track: la Sénia-Ain Témouchent. Minimum radius of curves, 500 m. Maximum up gradient, 1 in 67 Oran-Ain Témouchent; 1 in 83 Ain Témouchent-Oran. Maximum distance between stations, 13·4 km. (8½ miles) la Sénia-Misserghin. Minimum length of loop lines at stations, 182 m.

Speed and capacity

Overall time (including stops): passenger trains, 1 hr. 40 min. Capacity of line, 12 to 16 trains per day each way.

Miscellaneous

Marshalling yards at Oran and la Sénia. Locomotive repair shops and engine sheds at Oran.

GENERAL DESCRIPTION

This line leaves the main line from Oran at la Sénia and turns to the south-west towards the Sebkha d'Oran (Photo. 63). It crosses fertile and well-cultivated country, dotted with many farms, growing mainly wheat and vines. It follows the northern and western shore of the Sebkha, leaving it at Er Rahel to cross the Rio Salado and continue south-westward to Ain Témouchent. Its course is only slightly undulating as far as Rio Salado, and from there it rises to the agricultural and route centre of Ain Témouchent.

DETAILED DESCRIPTION

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
0·0	ORAN. (VILLE)	Alt. 364 ft. (111 m.). Goods and passenger station. Watering facilities (electric pump; public supply). Engine shed. Turntable (23 m.). Locomotive workshops (normal and 1·055-m. gauges) at c. 6 km.

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
6.1	LA SÉNIA	Alt. 295 ft. (90 m.). Marshalling yard. 1 loop line (182 m.). Junction with Oran–Oudjda line (Route 1). Line crosses main Oran–Mascara road.
19.5	MISSERGHIN	Alt. 338 ft. (103 m.). 1 loop line (351 m.). Line runs parallel with main road from Tlemcen to Oran via Ain Témouchent between wooded slopes of Djebel Murdjadjo on north and cultivated land on south.
31.0	BRÉDÉAH	Alt. 292 ft. (89 m.). Halt. No stop signals. Waterworks for Oran. Watering facilities (electric pump). 1 loop line (255 m.).
35.1	BOU TLÉLIS	Alt. 285 ft. (87 m.). 1 loop line (353 m.). Line runs close to Sebkha with main road on right.
46.7	LOURMEL	Alt. 305 ft. (93 m.). Watering facilities (public supply). 1 loop line (403 m.).
55.4	ER RAHEL	Alt. 328 ft. (100 m.). 1 loop line (351 m.).
61.0	..	Bridge over Rio Salado (Oued Melah), 45 m. (149 ft.), metal.
63.0	RIO SALADO	Alt. 243 ft. (74 m.). 1 loop line (397 m.). 1 siding (290 m.). Maximum gradient 1 in 67 from here to Ain Témouchent.
69.4	CHABET EL LEHAM (LAFERRIÈRE)	Alt. 508 ft. (155 m.). 1 loop line (364 m.).
69.9	..	Bridge over main road to Hammam bou Hadjar.
75.7	AIN TÉMOUCHENT	Alt. 781 ft. (238 m.). Watering facilities (electric pump; public supply). Turntable (14 m.). 1 loop line (490 m.).

3. TABIA–RAS EL MA (CRAMPEL)

Length

48 miles, 76.7 kilometres.

Traction

Steam.

Permanent way

Gauge: normal (1.435 m.). Single track throughout. Minimum radius of curves, 400 m. Maximum distance between stations, 16.7 km. (10 miles) Chanzy–Slissen. Minimum length of loop lines at stations, 235 m.

Speed and capacity

Overall time: passenger trains, 3 hrs. Capacity of line, 6 trains per day each way.

Miscellaneous

Engine sheds at Bedeau.

GENERAL DESCRIPTION

This line crosses the Tell Atlas to the High Plateaux and is an important link between the alfa grass region and the Oran–Oudjda line. Ras el Ma used to be connected with Modzbah on the Oran–Kenadza line by a narrow-gauge railway, but this is now disused. The line rises steadily from Tabia in the fertile and well-populated Bel Abbès plain, where it leaves the main line, and, following the valley of the Oued Mékerra, crosses a wooded highland and limestone region to the High Plateaux. It passes through regions where wheat, sheep, and esparto grass are the main products.

No details of engineering works are available.

DETAILED DESCRIPTION

<i>Distance in km. from Tabia</i>	<i>Stations</i>	<i>Remarks</i>
0.0	TABIA	Alt. 2,047 ft. (624 m.). Watering facilities (steam pump). 1 siding (300 m.). 1 loop line (375 m.). Junction with main line Oran–Oudjda (Route 1).
7.5	CHANZY	Alt. 2,185 ft. (666 m.). Watering facilities (electric pump). 1 loop line (353 m.). Valley of Oued Mékerra narrows, and wooded (pine, thuya, and mastic) highland rises on either side.
24.2	SLISSEN	Alt. 2,657 ft. (810 m.). 1 loop line (290 m.). Station for Télagh, connected with Slissen by road.
39.3	MAGENTA	Alt. 3,051 ft. (930 m.). Watering facilities (well). 1 loop line (260 m.). Road leads east to Bossuet (Daia).
46.6	LES PINS	Alt. 3,232 ft. (985 m.). Halt. No stop signals. Line reaches High Plateaux and woods give place to alfa steppe.
53.9	TITEN YAYA	Alt. 3,386 ft. (1,032 m.).
68.1	BEDEAU	Alt. 3,589 ft. (1,094 m.). Watering facilities (motor pump). Engine shed. Turntable (5.5 m.). 1 loop line (313 m.).
76.7	RAS EL MA (CRAMPEL)	Alt. 3,737 ft. (1,139 m.). 1 loop line (235 m.). At foot of Djebel Beguira. Centre of alfa production.

4. ORAN-HAMMAM BOU HADJAR

Length

45 miles, 72 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1.055 m.). Single track. Maximum distance between stations, 17 km. (11 miles) Arbal-Domaine d'Arbal.

Speed and capacity

Overall time (approx.): 1 hr. 30 min. Capacity of line, 2 trains per day each way.

GENERAL DESCRIPTION

This is a light railway which runs at first beside the Route Nationale from Oran to Arbal, and then turns westward following a secondary road across the Mléta plain. It links Oran and the small health resort of Hammam bou Hadjar where there are hot springs (p. 254). It runs parallel with the Oran-Algiers line (Route 7), crossing and recrossing it, and at Arbal the narrow-gauge line makes a sharp bend to the west and runs along the southern border of the Mléta plain at the northern edge of the Monts du Tessala. The southern part of the plain is cultivated and well populated.

DETAILED DESCRIPTION

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
0.0	ORAN	Alt. 364 ft. (111 m.). Separate light-railway station in Boulevard de Mascara. Railway runs alongside road N. 6.
5.5	LA SÉNIA	Alt. 295 ft. (90 m.).
10.0	..	Line crosses road.
11.0	VALMY	Alt. 302 ft. (92 m.).
11.5	..	Bridge over Oran-Algiers main line.
15.0	..	Line crosses road to Hammam bou Hadjar.
16.4	..	Bridge over Oran-Algiers main line.
17.0	ARBAL	Alt. 328 ft. (100 m.). Line turns south-west. 2 short bridges at km. 24.7, 25.0.
32.0	DOMAINE D'ARBAL	Alt. 413 ft. (126 m.). Line reaches foot of Monts du Tessala.
38.5	ST. MAUR	Alt. 558 ft. (170 m.).
45.0	..	Bridge over Oued Rassoul.

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
48.0	LE KHEMIS	Halt.
49.5	OUED SEBBAH	Alt. 548 ft. (167 m.). Halt.
53.0	LES TROIS MARABOUTS	Halt.
55.0	..	Bridge over Oued Besbes.
55.5	..	Halt.
60.0	AIN EL ARBA	Alt. 361 ft. (110 m.). 3 short bridges at km. 61.3, 62.3, 64.4.
68.0	HAMMAM BOU HADJAR	Alt. 502 ft. (153 m.).

5. BENI SAF-TLEMCEN

(Photo. 102)

Length

43 miles, 68.9 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1.055 m.). Single track throughout. Minimum radius of curves, 150 m. Maximum up gradient, 1 in 77 Tlemcen-Beni Saf, 1 in 40 Beni Saf-Tlemcen. Maximum distance between stations, 11.4 km. (7 miles) Hennaya-Bréa. Maximum distance between passing loops, 36.9 km. (23 miles) Beni Saf-Montagnac. Minimum length of loop lines at stations, 282 m.

Speed and capacity

Overall time (including stops): passenger trains, 2 hrs. 35 min. Capacity of line, 4 trains per day each way.

Miscellaneous

Engine sheds at Tlemcen and Beni Saf.

GENERAL DESCRIPTION

This line connects the port of Beni Saf with the main line from Oran to French Morocco. It ascends gradually all the way from Beni Saf, crossing first the eastern end of the Monts des Traras, and rising to the foothills of the Monts de Tlemcen. It follows the valley of the Oued Tafna from a point close to the coast as far as its confluence with the Oued Isser. Numerous streams are crossed.

From Montagnac it continues across a high plain well cultivated with olive groves and vineyards, and rises to Tlemcen where it joins the main Oran-Oudjda line.

DETAILED DESCRIPTION

<i>Distance in km. from Beni Saf</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BENI SAF	Alt. 6 ft. (2 m.). Watering facilities (public supply). Engine shed. Turntable (14 m.). 1 loop line (330 m.).
0.6	..	Metal skew bridge.
4.5	..	Tunnel (1,310 m.).
		3 short metal bridges at km. 6.2, 9.9, 10.2.
10.9	PONT DE TAZIA	Alt. 52 ft. (16 m.). No stop signals.
14.3	..	Bridge (25 m.), metal.
15.2	..	Bridge (15 m.), metal.
21.8	LA PIERRE DU CHAT	Alt. 122 ft. (37 m.). No stop signals.
24.9	..	Bridge over Oued Tafna (100 m.), metal.
25.6	..	Tunnel (204 m.).
26.5	..	Bridge over Oued Tafna (100 m.), metal.
29.3	..	Bridge over Oued Isser (40 m.), metal.
30.4	PLAINE DE REMCHI	Alt. 269 ft. (82 m.). Halt. No stop signals. Line leaves Tafna valley and crosses a ridge, gradient 1 in 40. A small bridge and culvert crossed at km. 32.2, 32.9.
36.9	MONTAGNAC	Alt. 705 ft. (215 m.). Watering facilities (public supply). 1 loop line (296 m.). Vineyards.
42.9	LAVAYSSIÈRE	Alt. 935 ft. (285 m.). 1 loop line (296 m.).
52.8	HENNAYA (EUGÈNE-ÉTIENNE)	Alt. 1,312 ft. (400 m.). 1 loop line (308 m.). Watering facilities (public supply). Several small bridges and culverts.
64.2	BRÉA	Alt. 2,205 ft. (672 m.). No stop signals. 2 small metal bridges (1 a skew bridge) at km. 68.3, 68.6.
68.9	TLEMCEN	Alt. 2,526 ft. (770 m.). Watering facilities (public supply). Engine shed. Turntables (14 m. and 4.4 m.). 1 loop line (282 m.). Junction with line (normal gauge) Oran-Oudjda (Route 1) (Photo. 102).

6. NEMOURS-OUJDJA (FRENCH MOROCCO)

Length

45 miles, 72 kilometres.

Traction

Steam.

Permanent way

Gauge: normal (1·435 m.). Single track. Minimum radius of curves, Zoudj el Béghal–Djemaa Sakra 300 m., Djemaa Sakra–Nemours 150 m. Maximum up gradient, 1 in 125 Oudjda–Nemours, 1 in 53 Nemours–Oudjda. Maximum distance between stations, 17·3 km. (10 $\frac{3}{4}$ miles) Zoudj el Béghal–Oudjda. Maximum distance between passing loops, 22·2 km. (13 $\frac{3}{4}$ miles) Bled es Souani–Nedroma. Minimum length of loop lines, 110 m.

Speed and capacity

Overall time (including stops): passenger trains, 3 hrs. 20 min. Capacity of line, 6 trains per day each way.

Miscellaneous

Marshalling yard at Oudjda. Engine sheds at Oudjda and Nemours.

GENERAL DESCRIPTION

This line rises from the coast across the Monts des Traras, following the valley of the Oued el Marsa at first and passing through numerous tunnels. There is a gradual ascent across the highland and on to the plain of Marnia with a slight descent to the Oued bou Naime and the Oued Mehaguen. The main Oran–Oudjda line is joined at Zoudj el Béghal. There is considerable transit trade from French Morocco along this line to the port of Nemours.

DETAILED DESCRIPTION

<i>Distance in km. from Nemours</i>	<i>Stations</i>	<i>Remarks</i>
0·0	NEMOURS	Alt. 10 ft. (3 m.). Watering facilities (motor pump). Engine shed. Triangle. 2 loop lines (475 m. and 110 m.).
0·3	..	Bridge over Oued el Marsa (50 m.).
1·6	..	Bridge over Oued el Marsa (42 m.). Several short culverts. 2 bridges over Oued el Marsa (30 m. each) at km. 3·9, 4·6.
5·1	..	Bridge over Oued el Marsa (50 m.).
6·1	DJEMAA SAKRA	Alt. 190 ft. (58 m.). Halt. No stop signals.
7·3	..	Bridge over Oued Taima (52 m.), skew (62°). Several culverts and short bridge.
11·5	NEDROMA	Alt. 482 ft. (147 m.). Watering facilities (motor pump). Turntable (4·4 m.). 1 loop line (500 m.).
12·8	..	Viaduct over Oued el Aioua (120 m.).
15·3	..	Viaduct over Oued Zlamet (225 m.).

<i>Distance in km. from Nemours</i>	<i>Stations</i>	<i>Remarks</i>
17·7	..	Tunnel (Sidi Brahim 2) 188 m.
18·3	..	Tunnel (Sidi Brahim 1) 211 m.
21·4	..	Tunnel (Sidi Moussa) 188 m.
21·9	SIDI BRAHIM	Alt. 1,040 ft. (317 m.). Halt. No stop signals.
23·1	..	Tunnel (Sidi Tahar) 292 m.
24·8	..	Tunnel (Colonne Montagnac) 242 m.
26·4	..	Tunnel (Kerkour) 569 m.
27·2	..	Tunnel (148 m.).
27·7	..	Tunnel (137 m.).
28·0	..	Tunnel (95 m.).
		Short bridge and several culverts.
33·7	BLED ES SOUANI	Alt. 1,610 ft. (491 m.). Watering facilities (motor pump). Turntable (4·4 m.). 1 loop line (550 m.).
		Short bridge and several culverts.
39·5	BENI OUASSINE	Alt. 1,542 ft. (470 m.). Halt. Turntable (4·4 m.).
		No stop signals. Several culverts.
45·1	..	Bridge over Oued Mouilah (66 m.), metal.
45·9	..	Bridge over Oued bou Naime (50 m.), metal.
		Several culverts.
53·6	..	Bridge over Oued Mehaguen (25 m.), skew (52°), metal.
54·7	ZOUDJ EL BÉGHAL	Alt. 1,460 ft. (445 m.). Watering facilities (motor pump). 1 loop line (540 m.). Junction for Oran-Oudjda line (Route 1).
56·3	..	Bridge over Oued Mehaguen (28 m.), metal.
71·2	..	Line joins Oran-Oudjda line (Route 1).
72·0	OUJDJA (FRENCH MOROCCO)	Alt. 1,785 ft. (544 m.). Engine shed. Marshalling yard (over 25 sidings of 275-450 m. each). Triangle. Junction with line to Bou Arfa (French Morocco).

7. ORAN-ALGIERS

(Photos. 104-108)

Length

Oran-Relizane	81·6 miles	130·5 kilometres
Relizane-Affreville	110·0 "	176·2 "
Affreville-el Affroun	31·9 "	51·0 "
El Affroun-Algiers	42·8 "	68·4 "
	<u>266·3</u>	<u>426·1</u>

Branch lines

The line to Ain Témouchent (Route 2) leaves at la Sénia, mile 6·5 (km. 10·5); that to Oudjda (Route 1) at Ste. Barbe du Tlélat, mile 19 (km. 31); narrow-gauge lines north to Arzeu (Route 8) and south to Kenadza

(Route 8) at Perrégaux, mile 50 (km. 81); narrow-gauge lines north to Mostaganem (Route 9) and south to Tiaret and Burdeau (Route 9) at Relizane, mile 82 (km. 130.5); normal-gauge line to Marengo (Route 10) at el Affroun, mile 223 (km. 357); narrow-gauge line to Djelfa (Route 11) at Blida, mile 234 (km. 376).

Traction

Steam.

Permanent way

Gauge: normal (1.435 m.). Double track: Oran–Ste. Barbe du Tlélat, Malakoff–Oued Fodda, and el Affroun–Algiers; single track: Ste. Barbe du Tlélat–Malakoff and Oued Fodda–el Affroun. Maximum axle load, 18½ tons. Minimum radius of curves, 100 m. Oran (Marine)–Oran (Ville), and 300 m. Oran (Ville)–Algiers. Maximum up gradient, 1 in 50 in each direction Oran (Ville)–Algiers, and 1 in 33 Oran (Marine)–Oran (Ville). Maximum distance between passing loops, 20.8 km. (13 miles) Ferry (les Salines)–St. Aimé (Djidiouia). Minimum length of loop lines at stations, 300 m.

Speed and capacity

Overall time: passenger trains, 6 hrs. 45 min. Capacity of line, 10 trains per day each way.

Miscellaneous

Marshalling yards at Oran (Marine), la Sénia, and Algiers. Locomotive repair shops at Oran and Algiers. Engine sheds at Oran, Perrégaux, Relizane, Orléansville, Affreville, el Affroun, Blida, and Algiers.

GENERAL DESCRIPTION

This line links the two main ports of the country, following the great trough or depression which extends from Oran to Algiers: it is bounded on the north by the Sahel of Oran, the Dahra, and the Sahel of Algiers, and on the south by the Ouarsenis mountains and the northern ridges of the Atlas. By taking advantage of this trough of lowland the line has a comparatively easy course, except for the crossing of the Massif de Miliana. From Oran it crosses the plains of Figuier and Tlélat to Ste. Barbe du Tlélat. It then follows the northern edge of the Monts des Beni Chougran and crosses the southern edge of the plains of the Sig and Habra to Perrégaux. From here to Relizane it continues across the Habra plain into the plain of the Oued Mina through well-cultivated land, crossing a ridge of higher land between the two lowlands. Relizane is an important agricultural

centre situated where the Oued Mina leaves the highlands and opens out to the Chélif plain. The line turns north-east from Relizane and follows the left bank of the Chélif, rising most of the way. The character of the country changes beyond Affreville and the line crosses the eastern end of the Massif de Miliana (Djebel Zaccar) and the Soumata highland, which separates the Chélif valley from the Mitidja plain. The line rises steeply to Miliana-Margueritte station and descends thence to el Affroun. At Bou Medfa it joins the valley of the Oued Djer. From el Affroun to Algiers it crosses the richly cultivated plain of the Mitidja. On reaching Maison Carrée the line turns north and then west along the Baie d'Alger.

DETAILED DESCRIPTION

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
0.0	ORAN (MARINE)	Alt. 6 ft. (1.6 m.). For line between Oran (Marine) and Ste. Barbe du Tlélat, <i>see</i> pp. 352-353 (Route 1).
30.9	STE. BARBE DU TLÉLAT	Alt. 456 ft. (139 m.). Watering facilities (electric pump). Turntable (14 m.). 1 loop line (465 m.). 1 siding (360 m.). Junction with main line to Oudjda (Route 1).
34.1	..	Bridge over Oued Tlélat (15 m.).
45.0	LA MARE D'EAU	Alt. 417 ft. (127 m.). 1 loop line (618 m.). Line skirts southern end of forest of Moulay Ismail.
50.3	L'OUGASSE	Alt. 236 ft. (72 m.). Halt.
50.5	..	Bridge over Oued Ougasse (10 m.), metal.
55.8	..	Bridge over Oued Sig (20 m.), reinforced concrete.
56.1	ST. DENIS DU SIG	Alt. 177 ft. (54 m.). Watering facilities (public supply). Turntable (5.5 m.). 1 loop line (346 m.). 2 sidings (each 230 m.).
66.6	L'HABRA (BOU HENRI)	Alt. 56 ft. (17 m.). 1 loop line (348 m.).
79.5	..	Bridge over Oued Habra; reinforced concrete, 3 spans slabs or beams, 3 spans arches. Centre arch span is over river. Abutments and piers, concrete.
80.9	PERRÉGAUX	Alt. 141 ft. (43 m.). Engine shed. Watering facilities (public supply). Turntable (14 m.). 1 loop line (632 m.). 1 siding (320 m.). Mixed repair shops for locomotives, carriages, and wagons of 1.055-m. gauge. Junction with narrow-gauge line north to Oran and south to Kenadza (Route 8). Line runs parallel with main road.

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
86.3	SAHOURIA	Alt. 148 ft. (45 m.). Halt. No stop signals.
93.4	..	Bridge over Oued Melah (15 m.), metal.
94.8	NOUVION-OUED MELAH	Alt. 302 ft. (92 m.). 1 loop line (564 m.).
101.9	..	Bridge (12 m.), metal. Line enters a more hilly region.
111.9	L'HILLIL	Alt. 427 ft. (130 m.). Watering facilities (public supply). 1 loop line (474 m.).
112.0	..	Bridge. Line crosses plain of Oued Mina and enters Oued Chélif plain.
122.0	LES SILOS (CLINCHANT)	Alt. 213 ft. (65 m.). Halt. No stop signals.
127.3	..	Bridge over Oued Mina (45 m.), metal and reinforced concrete.
130.5	RELIZANE	Alt. 222 ft. (67.5 m.). Watering facilities (public supply). Turntable (17 m.). Engine shed. 1 loop line (525 m.). 2 sidings (each 310 m.). Junction with narrow-gauge line north to Mostaganem and south to Burdeau (Route 9).
143.3	FERRY (LES SALINES)	Alt. 193 ft. (59 m.). 1 loop line (580 m.). Line skirts southern side of Sidi bou Ziane salt marsh.
164.1	ST. AIMÉ (DJIDIOUIA)	Alt. 216 ft. (66 m.). Watering facilities (motor pump). 1 loop line (480 m.).
164.7	..	Bridge over Oued Djidiouia (30 m.), metal. Line enters valley of Oued Chélif.
172.9	INKERMANN (OUED RIOU)	Alt. 230 ft. (70 m.). Turntable (4.4 m.). 1 loop line (410 m.).
173.9	..	Bridge over Oued Riou (50 m.), metal and reinforced concrete.
183.7	LA MERDJA	Line follows ridge of rocky hills cut by ravines. Alt. 253 ft. (77 m.). Watering facilities (motor pump). 1 loop line (540 m.).
195.0	CHARON (BOU KADER)	Alt. 269 ft. (82 m.). 1 loop line (300 m.).
196.5	..	Bridge over Oued Taflout (25 m.), metal.
199.6	..	Bridge over Oued Sly (35 m.).
202.7	MALAKOFF (OUED SLY)	Alt. 299 ft. (91 m.). From here to Oued Fodda the track is double.
216.3	..	Small bridges at km. 209.9, 210.7, 215.4. Bridge over Oued Tiraout (25 m.), stone under one track, concrete under other.
217.8	ORLÉANSVILLE	Alt. 394 ft. (120 m.). Watering facilities (public supply). Turntable (17 m.). 5 sidings, 3 of 370 m. each and 2 of 305 m. each. Engine shed.
223.2	PONTÉBA	Narrow-gauge line to Ténès now closed. Alt. 371 ft. (113 m.).
225.9	..	Bridge over road (N. 4).

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
231.4	LE BARRAGE	Alt. 551 ft. (168 m.). 1 siding (600 m.). Line makes sharp bend to the south to Oued Fodda to avoid a short gorge of the Oued Chélif through the southern wooded slopes of the Dahra.
240.3	OUED FODDA	Alt. 522 ft. (159 m.). Watering facilities (electric pump). 1 siding (600 m.). The Oued Fodda joins the Oued Chélif 7 km. to the north, near which a barrage on the Chélif has been built.
241.6	..	Bridge over Oued Fodda (50 m.), metal and concrete.
243.7	TÉMOULGA- VAUBAN	Alt. 515 ft. (157 m.). Halt. Line passes close to foot of Djebel Témoulga.
253.6	LES ATTAFS- CARNOT	Alt. 518 ft. (158 m.). 1 loop line (425 m.). Line returns to left bank of Oued Chélif.
257.0	ST. CYPRIEN DES ATTAFS	Alt. 555 ft. (169 m.). Halt. No stop signals.
263.0	STE. MONIQUE	Halt. No stop signals.
266.3	ROUINA	Alt. 623 ft. (190 m.). Watering facilities (electric pump). Turntable (5 m.). 1 loop line (550 m.). 2 sidings (each 260 m.).
266.7	..	Bridge over Oued Rouina (50 m.), metal. Iron-mining area to south connected by narrow-gauge mineral line (p. 237).
272.5	KHERBA	Alt. 682 ft. (208 m.). 1 loop line (435 m.). Line passes through vineyards and skirts northern edge of Djebel Doui.
280.8	DUPERRÉ	Alt. 896 ft. (273 m.). Watering facilities (well). 1 loop line (435 m.). 2 short bridges.
288.4	..	Bridge over Oued Chélif (96 m.), reinforced concrete.
292.4	LES ARIB (LITTRÉ)	Alt. 853 ft. (260 m.). 1 loop line (550 m.). Line now follows southern slopes of Dahra, leaving Oued Chélif to the south. Vineyards and palm groves. Short bridges over streams at km. 294.2, 296.8, 299.4, 301.1.
302.1	LAVARANDE	Alt. 958 ft. (292 m.). 1 loop line (435 m.).
306.7	AFFREVILLE	Alt. 1,024 ft. (312 m.). Watering facilities (public supply). Turntable (17 m.). 1 loop line (670 m.). Sidings. Engine shed.
308.3	..	Bridge over road (N. 4), 15 m. metal. Line rises with gradients of 1 in 50 to Miliana-Margueritte.
309.5	..	Tunnel (480 m.).
313.9	..	Viaduct (83 m.), stone.
314.1	..	Viaduct (58 m.), stone.
316.6	MILIANA- MARGUERITTE	Alt. 1,643 ft. (501 m.). 1 loop line (535 m.). Watering facilities (well). This station serves Margueritte (4 miles, 7 km.

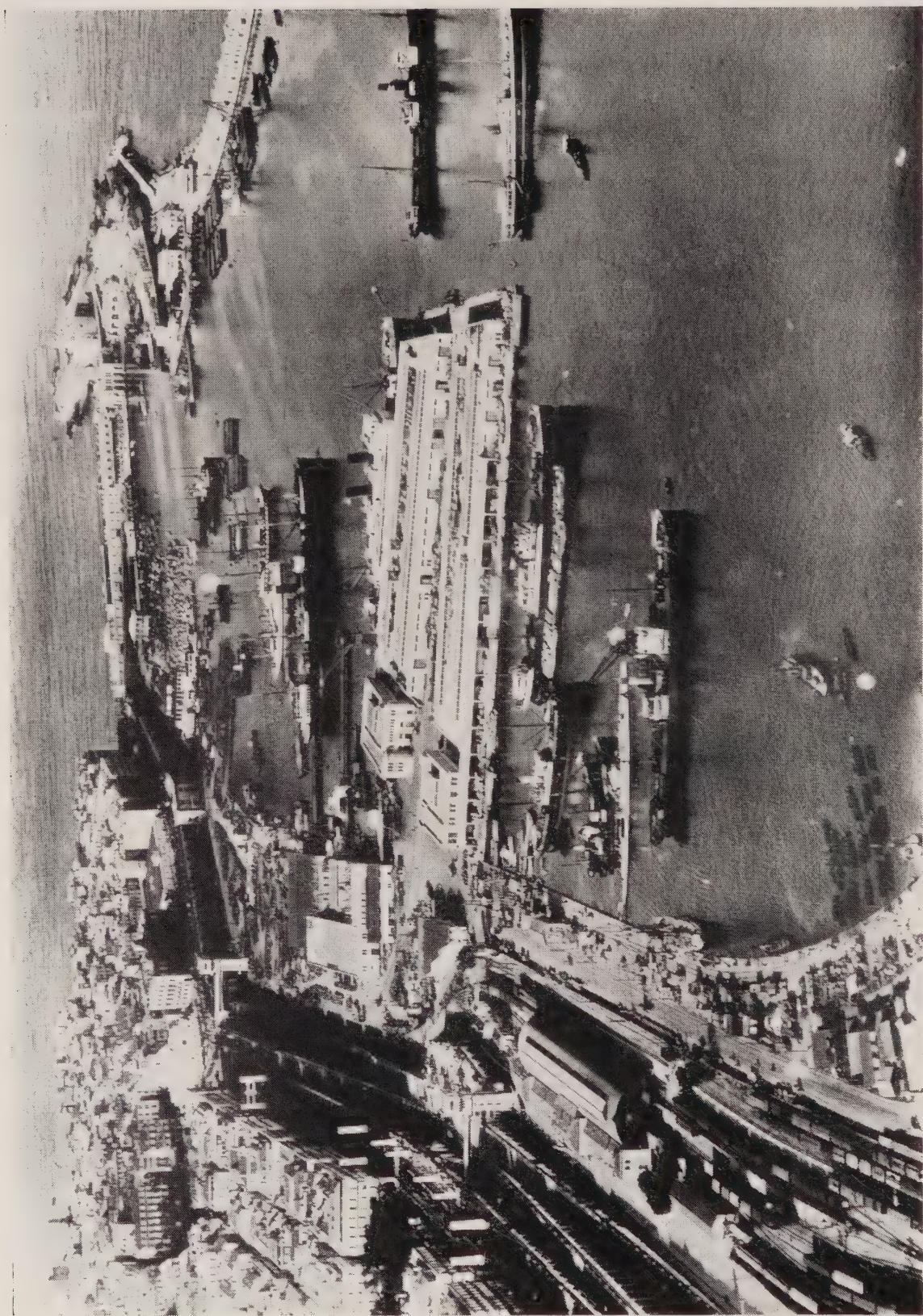
<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
		north) and Miliana (6 miles, 9 km. west). A tramway runs alongside the road to Miliana.
		Highest point on line. From here line descends with gradients of 1 in 50 following valley of Oued Zeboudj between Djebel Zaccar and Djebel Gontas.
319.0	..	Tunnel (2,312 m.).
321.8	..	Viaduct (228 m.), stone.
328.3	VÉSOUL BENIAN	Alt. 1,004 ft. (306 m.). 1 loop line (530 m.). Between here and Bou Medfa there are 4 bridges, each 25 m. metal, over the Oued Zeboudj at km. 329.2, 332.9, 334.2, 335.0.
		Line skirts northern foothills of Atlas mountains.
335.9	BOU MEDFA	Alt. 787 ft. (240 m.). 1 loop line (660 m.). Watering facilities (electric pump).
336.6	..	Bridge over Oued el Hammam (35 m.), metal.
342.6	..	Bridge over Oued Djer (35 m.), metal.
343.7	..	Tunnel (250 m.).
344.1	..	Bridge over Oued Djer (35 m.), metal.
344.6	..	Tunnel (270 m.).
344.7	..	Bridge over Oued Djer (35 m.), metal.
346.4	..	Tunnel (275 m.).
348.7	OUED DJER	Alt. 472 ft. (144 m.). 1 loop line (530 m.). Line reaches Mitidja plain.
		2 bridges over Oued Djer (35 m.), metal, at km. 351.0 and 356.7.
357.7	EL AFFROUN	Alt. 299 ft. (91 m.). Watering facilities (public supply). Turntable (17 m.). 3 sidings, each of 265 m. Engine shed. Junction with line to Marengo (Route 10). From here to Algiers track is again double.
360.0	..	Bridge over Oued bou Roumi (37 m.), reinforced concrete girders under north line, steel girders under south line.
363.8	MOUZAIIVILLE	Alt. 381 ft. (116 m.). 1 siding (600 m.).
368.1	LA CHIFFA	Alt. 357 ft. (109 m.). 1 siding (500 m.). Bridge over Oued Chiffa, spans 4 × 50 m. Cast-iron arch ribs (2 in each span) under south line and reinforced concrete arch under north line.
		Line ascends with gradients of 1 in 50.
375.9	BLIDA	Alt. 692 ft. (211 m.). Watering facilities (public supply). Turntable (14 m.). 1 siding (450 m.). Engine shed. Junction with narrow-gauge line to Djelfa (Route 11) (separate stations).
		Line turns north-eastward and descends again with gradients of 1 in 70 to Mitidja.
382.1	BENI MERED	Alt. 485 ft. (148 m.). 1 siding (580 m.).
388.2	..	Short reinforced concrete bridge over Oued el Krémis.



106. *Sidings and warehouses between Agha and Gare Centrale, Algiers*



107. *Algiers, Gare Centrale (Route 7)*



108. Algiers: Gare Centrale, Môle Al Djénia, and Vieux Port

<i>Distance in km. from Oran (Marine)</i>	<i>Stations</i>	<i>Remarks</i>
389.3	BOUFARIK	Alt. 203 ft. (62 m.). Watering facilities (public supply). 2 sidings, each 400 m. Important agricultural centre.
390.0	..	Bridge (20 m.) over Oued bou Chemla.
394.3	SIDI AID	Alt. 151 ft. (46 m.). No stop signals.
400.6	BIRTOUTA-CHEBLI	Alt. 115 ft. (35 m.). 1 siding (600 m.).
406.1	BABA ALI	Alt. 92 ft. (28 m.). 1 siding (600 m.). 2 short stone bridges at km. 407.7, 409.8. Line follows left bank of Oued Harrach.
411.2	GUÉ DE CONSTAN- TINE	Alt. 45 ft. (14 m.). 1 siding (600 m.).
415.8	MAISON CARRÉE	Alt. 42 ft. (13 m.). Watering facilities (public supply). Turntable (8 m.). 2 platforms (1 c. 240 m.). 4 running lines through station. 4 sidings, each c. 300 m. 2 dead-end sidings, each c. 450 m. Carriage and wagon shops. Junction with line from Algiers to Constantine (Route 12).
416.1	..	Stone bridge over road N. 5.
417.6	HIPPODROME DU CAROUBIER	Halt. Short line north to Harrach oil installation.
420.1	HUSSEIN DEY	Alt. 19 ft. (6 m.). 8 loop sidings (total length c. 3,000 m.). 2 dead-end sidings c. 275 m. each.
423.1	ALGIERS (ATELIERS) (ABATTOIR)	Alt. 23 ft. (7 m.). Watering facilities (tank). Coaling plant. 2 turntables (35 m. and 17 m.). Engine shed. Large locomotive repair shops for all gauges, mainly normal. Sidings to oil discharging and bunkering quays, power station, oil installation, and Môle Louis Billiard.
424.7	ALGIERS (AGHA)	Alt. 9 ft. (3 m.). Watering facilities (public supply). Turntable (23.5 m.). Goods shed (7 tracks). Engine shed. Passenger and main goods station. 2 platforms, each c. 250 m. About 20 loop sidings and 4 dead-end sidings, total length c. 10,000 m. Sidings to Grand Môle, Môle aux Minerais, and Môle Amiral Mouchez (Photo. 106).
426.1	ALGIERS (GARE CENTRALE)	Alt. 6 ft. (2 m.). Watering facilities (public supply). Terminal station (passenger), 1 single and 2 island platforms. 5 lines to platforms. 1 run-round loop. 4 carriage sidings. 3 sidings to Môle Al Djefna (Photos. 104-108).

8. ORAN-PERRÉGAUX-KENADZA

(Photos. 55, 109, 110)

Length

Oran-Damesme	26 miles	42.4 kilometres
Damesme-Perrégaux	28 „	46.3 „
Perrégaux-Tizi	31 „	49.5 „
Tizi-Ain Sefra	220 „	353.9 „
Ain Sefra-Colomb Béchar	159 „	256.3 „
Colomb Béchar-Kenadza	14 „	21.7 „
	<hr/> 478	<hr/> 770.1

Branch lines

The line to Arzeu leaves at Damesme, mile 26 (km. 42.4); that to Mostaganem at la Macta, mile 37 (km. 58.9); that to Mascara at Tizi, mile 85 (km. 138.2); the normal-gauge line to Oudjda and French Morocco at Colomb Béchar, mile 465 (km. 748.4).

Traction

Steam.

Permanent way

Gauge: narrow (1.055 m.). Single track. Minimum radius of curves, 150 m. Maximum up gradient, 1 in 34 Oran-Kenadza, 1 in 40 Kenadza-Oran. Maximum distance between passing loops, 34.8 km. (21 miles) Naama-Mékalis and Mékalis-Ain Sefra. Minimum length of loop lines at stations, 78 m.

Speed and capacity

Overall time: passenger trains, 21 hrs. 30 min. to Colomb Béchar. Capacity of line, 6 trains per day each way.

Miscellaneous

Marshalling yards at Oran. Locomotive repair shops at Oran. Engine sheds at Oran, Perrégaux, Tizi, Saida, le Kreider, Mechéria, Ain Sefra, Beni Ounif de Figuig, Colomb Béchar, and Kenadza.

GENERAL DESCRIPTION

This narrow-gauge line leaves Oran from the Gare de l'État and turns north-east across a well-cultivated region with extensive vineyards. The small towns through which it passes at first are compact agricultural centres. At Damesme junction the line reaches the Golfe d'Arzeu, and the line to Arzeu turns north along the coast. The main line continues round the coast of the Golfe d'Arzeu to la Macta, where the line crosses the Oued Macta (Oued Habra). The line then

crosses the vast Macta marshes from north to south to Perrégaux on the Oued Habra, where it meets the normal-gauge line from Oran to Algiers. There are two stations, one on the normal-gauge line, the other on the narrow. South of Perrégaux the line crosses the Monts des Beni Chougran which separate the Habra and Eghris plains, and follows the valley of the Oued el Hammam, which cuts right through the highland. At Tizi there is a branch line east to Mascara. This used to continue to Uzès-le-Duc on the Mostaganem-Burdeau line, but information about this line and its branch westward from Tizi to Sidi bel Abbès is not available for publication. From Tizi the Eghris plain is crossed and the line rises gradually to the Monts de Saïda, through which it follows the valley of the Oued Saïda, eventually reaching the steppe land of the High Plateaux. At one time a branch line ran westward from Modzbah to Ras el Ma (Crampel), principally for the transport of alfa, but it fell into disuse and has probably been removed. After passing le Kreider the Kenadza line crosses the depression in which the Chott Chergui is situated, and continues across the High Plateaux to Ain Sefra at the northern foot of the Saharan Atlas. It crosses the Monts des Ksour to Figuig and Colomb Béchar; where it leaves the southern slopes of the Atlas and enters the plains of the Sahara the surface becomes sandy. Between Colomb Béchar and Kenadza the line is duplicated by the extension of the normal-gauge line through French Morocco from Oudjda and Bou Arfa. This line is the northern end of the proposed trans-Saharan or Mediterranean-Niger railway (Appendix D). It has been completed to Kenadza, and the next section to Beni Abbès is in course of construction.

DETAILED DESCRIPTION

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
0.0	ORAN	Alt. 364 ft. (111 m.). Goods and passenger station. Watering facilities. Engine shed. Locomotive workshops. Line passes north-east corners of the Petit Lac and the Grand Lac.
7.7	ST. RÉMY	Alt. 305 ft. (93 m.).
11.3	SIDI CHAMI	Alt. 311 ft. (95 m.). 1 loop line (305 m.).
14.4	ASSI BOU NIF	Alt. 315 ft. (96 m.). 1 loop line (346 m.).
17.7	ASSI AMEUR	Alt. 308 ft. (94 m.). 1 loop line (300 m.).
20.5	FLEURUS	Alt. 328 ft. (100 m.). Line crosses undulating plateau at foot of Djebel Orousse.
28.3	ST. CLOUD	Alt. 446 ft. (136 m.). Watering facilities. 1 loop line (318 m.).

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
33·8	RENAN-KLÉBER	Alt. 430 ft. (131 m.). 1 loop line (300 m.).
36·1	STE. LÉONIE	Alt. 357 ft. (109 m.). 1 loop line (300 m.). Line descends to Damesme with gradients of 1 in 45.
42·4	DAMESME	Alt. 13 ft. (4 m.). Watering facilities. 2 loop lines (245 m. and 290 m.). Junction with line to Arzeu.

Branch line to Arzeu

0·0	DAMESME	Line follows coast of Golfe d'Arzeu.
3·5	..	Bridge over Oued Magoun. Distances from Damesme.
4·0	ARZEU	Alt. 16 ft. (5 m.). Watering facilities. Sidings. Line continues beyond station to Mole No. 3 and Grand Quai. Narrow-gauge line south to les Salines (20 km., 12½ miles) on el Mellaha depression: used almost exclusively for transport of salt (p. 138).

45·2	ST. LEU	Alt. 10 ft. (3 m.). Halt.
54·5	PORT AUX POULES	Alt. 26 ft. (8 m.). Halt. 1 loop line (100 m.).
58·9	LA MACTA	Alt. 16 ft. (5 m.). Watering facilities. 1 loop line (360 m.). Junction with line to Mostaganem.

Branch line to Mostaganem

0·0	LA MACTA	This line is now closed to ordinary passenger traffic. Line runs inland, rising on to a well-cultivated plateau.
14·0	NOISY-LA STIDIA	Alt. 400 ft. (122 m.). Distances from la Macta. Station for Noisy-les-Bains (1½ miles south) and la Stidia (2½ miles north).
20·5	..	Bridge over road N. 17.
22·0	RIVOLI	Alt. 502 ft. (153 m.).
27·0	MAZAGRAN	Alt. 459 ft. (140 m.). Gradual descent to Mostaganem.
30·0	MOSTAGANEM (VILLE)	Alt. 390 ft. (119 m.). Watering facilities. Sidings. The town railway station (Mostaganem Ville) is just east of the Town Hall (Fig. 30). The port railway station (Mostaganem Marine; Gare Maritime) is behind the Quai Est. From here line runs south-westward behind the quay, enters a tunnel about 227 metres long at the root of Môle Est, continues south-westward for about 1 mile, and then bends round to run north-eastward to the town station.

59·2	..	Bridge (35 m.), metal, over Macta marshes forming outlet of Oueds Sig and Habra.
71·0	FORNAKA	Alt. 29 ft. (9 m.). Halt. 1 loop line (153 m.).
71·4	..	Bridge over Oued Tinn (48 m.), stone.

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
75.9	DEBROUSSEVILLE	Alt. 39 ft. (12 m.). Watering facilities. 1 loop line (380 m.).
80.1	LA FERME BLANCHE	Alt. 65 ft. (20 m.). Halt. 1 loop line (250 m.).
88.7	PERRÉGAUX	Alt. 141 ft. (43 m.). Watering facilities. Engine shed. Mixed repair shops for locomotives, carriages, and wagons of 1.055-m. gauge. 1 loop line (300 m.). Junction (separate stations) with Oran-Algiers line (Route 7). From Perrégaux line follows valley of Oued Habra.
91.2	..	Bridge over Oued Habra, steel girder, spans 3 × 40 m.
98.5	LE BARRAGE	Alt. 347 ft. (106 m.). Halt.
100.0	Oued FERGOUG	Alt. 374 ft. (114 m.). 1 loop line (298 m.).
103.1	..	Bridge over Oued el Hammam (60 m.), metal. 2 more bridges (both 40 m.), metal, over same river at km. 104.8, 105.5.
108.5	DUBLINEAU	Alt. 442 ft. (135 m.). Watering facilities. 1 loop line (174 m.). Short stone bridge.
117.4	LA GUETNA	Alt. 577 ft. (176 m.). Halt. Loop line (110 m.).
117.8	..	Bridge over Oued el Hammam (95 m.), metal, 3 spans.
125.3	BOU HANIFIA	Alt. 751 ft. (229 m.). 1 loop line (324 m.). Bou Hanifia dam (p. 203) is 2½ miles south of station. Line crosses ridge of hills separating valley of Oued el Hammam and Eghris plain, with steep gradient of 1 in 37 from the valley to Tizi.
138.2	TIZI	Alt. 1,493 ft. (455 m.). Watering facilities. Engine shed. 2 loop lines (365 m. and 420 m.). Junction with branch line to Mascara.

Branch line to Mascara

0.0	TIZI	..
3.9	SIDI MAAMAR	Alt. 1,502 ft. (458 m.). Halt. 1 loop line (107 m.). Distances from Tizi.
11.9	MASCARA	Alt. 1,836 ft. (568 m.). Watering facilities. Engine shed. 1 loop line (398 m.).
145.1	FROHA	Alt. 1,561 ft. (476 m.). Halt.
149.3	THIERSVILLE	Alt. 1,643 ft. (501 m.). Watering facilities. 1 loop line (295 m.).
164.3	Oued TARIA	Alt. 1,620 ft. (494 m.). 1 loop line (458 m.).
168.9	..	Bridge over Oued Taria (25 m.), metal. Line enters valley of Oued Saida.
178.3	CHARRIER	Alt. 1,791 ft. (546 m.). 1 loop line (275 m.).
182.7	FRANCHETTI	Alt. 1,880 ft. (573 m.). Watering facilities. 1 loop line (225 m.).
195.3	LES EAUX CHAUDES	Alt. 2,149 ft. (655 m.). Halt. 1 loop line (78 m.).

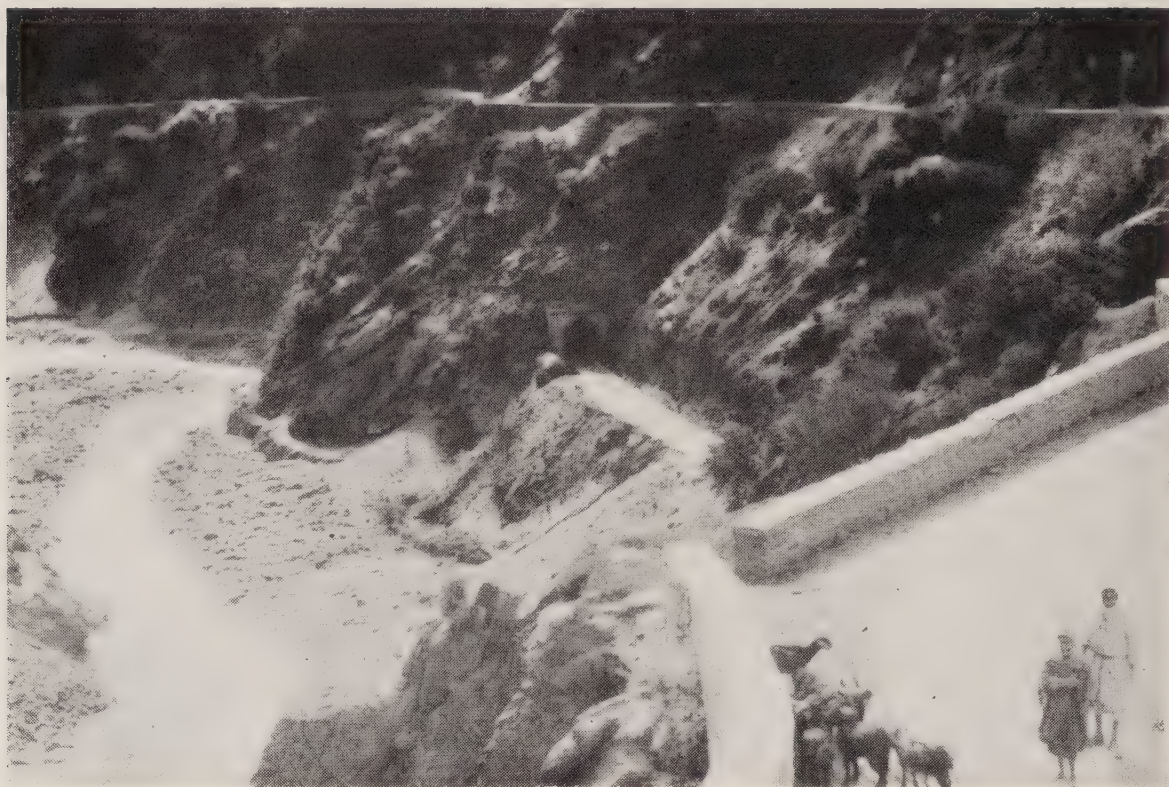
<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
203·7	NAZREG-FLINOIS	Alt. 2,418 ft. (737 m.). 1 loop line (256 m.).
208·8	SAIDA	Alt. 2,650 ft. (808 m.). Watering facilities. Engine shed. 1 loop line (295 m.). Agricultural centre. Line approaches crest of a high plateau by a difficult and steep ascent over a series of sharp curves and with gradients of 1 in 37. 3 short metal bridges.
219·7	AIN EL HADJAR	Alt. 3,330 ft. (1,015 m.). Watering facilities. 1 loop line (310 m.).
228·2	BOU RACHED	Alt. 3,740 ft. (1,140 m.). Halt. 1 loop line (330 m.).
232·0	..	Crest of plateau. Alt. 3,839 ft. (1,170 m.).
243·4	TAFAROUA	Alt. 3,776 ft. (1,151 m.). Halt.
252·3	KRALFALLAH	Alt. 3,642 ft. (1,110 m.). Watering facilities. 1 loop line (323 m.).
261·7	MOULAY ABD EL KADER	Alt. 3,563 ft. (1,086 m.). Halt. 1 loop line (164 m.).
268·1	EL BEIDA	Alt. 3,494 ft. (1,065 m.). Halt. 1 loop line (190 m.).
275·7	MODZBAH	Alt. 3,471 ft. (1,058 m.). Watering facilities. 1 loop line (217 m.).
285·9	TIN BRAHIM	Alt. 3,458 ft. (1,054 m.). Halt. 1 loop line (199 m.).
294·6	ASSI EL MADANI	Alt. 3,425 ft. (1,044 m.). Halt. 1 loop line (218 m.).
309·1	LE KREIDER	Alt. 3,241 ft. (988 m.). Watering facilities. Engine shed. 1 loop line (350 m.). Line borders the Chott Chergui.
322·3	BOUKTOUB	Alt. 3,264 ft. (995 m.). 1 loop line (205 m.).
336·4	REZAINA	Alt. 3,412 ft. (1,040 m.). Halt.
350·4	BIR SENIA	Alt. 3,422 ft. (1,046 m.). Halt. 1 loop line (240 m.).
361·0	EL BIOD	Alt. 3,402 ft. (1,037 m.). Watering facilities. 1 loop line (233 m.). Line rises gradually to Mechéria.
374·0	KREBBAZA	Alt. 3,461 ft. (1,055 m.). Halt.
381·5	TENIET EL REHLEM	Alt. 3,606 ft. (1,099 m.). Halt.
389·8	MECHÉRIA	Alt. 3,803 ft. (1,159 m.). Watering facilities. Engine shed. 1 loop line (329 m.). At foot of Djebel Antar country becomes more barren and rocky.
400·1	TOUIFZA	Alt. 3,688 ft. (1,124 m.). Halt.
411·2	EL HARCHAIA	Alt. 3,786 ft. (1,154 m.). Halt.
422·5	NAAMA	Alt. 3,825 ft. (1,166 m.). Watering facilities. 1 loop line (230 m.). Region of low sand-dunes.
434·5	SOUIGA	Alt. 3,874 ft. (1,181 m.). Halt. Short bridge over watercourse at km. 443·7.
446·5	AIN MOKTA DELI	Alt. 4,134 ft. (1,260 m.). Halt.



109. *Kenadza station (Route 8)*



110. *Fortified station, Djenien bou Rezg (Route 8)*



III. *Road and railway in the Chiffa gorge, near Blida (Route II)*



II2. *Palestro viaduct (Route I2)*

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
457·3	MÉKALIS	Alt. 4,311 ft. (1,314 m.). Watering facilities. 1 loop line (240 m.). Summit of line. Short bridge over watercourse. Line crosses depression of Faidjet el Betoum between Djebel Morhad and Djebel Aissa.
468·4	BOU GHELLABA	Alt. 4,068 ft. (1,240 m.). Halt. 2 short bridges at km. 474·9, 476·9.
480·4	TIRKOUNT	Alt. 3,891 ft. (1,186 m.). Halt.
492·1	AIN SEFRA	Alt. 3,471 ft. (1,058 m.). Watering facilities. Engine shed. 1 loop line (230 m.). Station is a dead end, which trains enter and leave from south. Engine sheds west of station. Fortified station. Between Ain Sefra and Djenien bou Rezg railway crosses the Monts des Ksour by circuitous course.
503·2	TIOUT	Alt. 3,363 ft. (1,025 m.). Halt. 1 loop line (138 m.). Oasis. Line descends rapidly.
504·9	..	Bridge over Oued Sefra (60 m.), steel.
516·1	AIN EL HADJADJ	Alt. 3,300 ft. (1,006 m.). Halt. 1 loop line (212 m.). Line enters upper valley of Oued Namous.
526·8	ROUIBA	Alt. 3,041 ft. (927 m.). Halt. 1 loop line (227 m.). Bridge over Oued Mekter (30 m.), metal.
537·8	DRA ES SAA	Alt. 2,969 ft. (905 m.). Halt.
545·9	MOGHAR FOUKANI	Alt. 3,008 ft. (917 m.). Oasis. Watering facilities. 1 loop line (125 m.). Line passes through Moghar gorge.
551·0	..	Bridge over watercourse (48 m.), stone.
556·2	LES OGLATS	Alt. 3,294 ft. (1,004 m.). Halt. 1 loop line (245 m.).
567·8	DAYET EL KERCH	Alt. 3,415 ft. (1,041 m.). Halt. 1 loop line (226 m.). Short bridge.
576·5	DJENIEN BOU REZG	Alt. 3,297 ft. (1,005 m.). Watering facilities. 1 loop line (226 m.). Fortified station (Photo. 110). Line follows Oued Dermal. Short bridge.
592·1	HADJERAT M'GUILL	Alt. 3,097 ft. (944 m.). Halt. 1 loop line (230 m.).
597·8	..	Bridge over Oued Dermal (120 m.), metal.
609·9	DUVEYRIER	Alt. 2,834 ft. (864 m.). 1 loop line (252 m.).
622·7	OUED EL ASSI	Alt. 2,772 ft. (845 m.). Halt. 1 loop line (233 m.).
630·7	..	Bridge over Oued Tisserfine (120 m.), metal, followed by 2 short bridges.
637·3	BENI OUNIF DE FIGUIG (RÉVOIL)	Alt. 2,703 ft. (824 m.). Watering facilities. Engine shed. 1 loop line (210 m.). Short metal bridge over Oued Zousfana. Line runs westward skirting southern slopes of Djebel Grouz.
655·6	MERIRÈS	Alt. 2,903 ft. (885 m.). Halt. 4 short metal bridges.
671·8	BOU AIECH	Alt. 3,133 ft. (955 m.). Halt. Watering facilities. 1 loop line (142 m.).

<i>Distance in km. from Oran</i>	<i>Stations</i>	<i>Remarks</i>
697·4	BEN ZIREG	Alt. 3,149 ft. (960 m.). Halt. 1 loop line (242 m.). 4 short metal bridges.
724·2	HASSI EL HAOUARI	Alt. 2,769 ft. (844 m.). Halt. Watering facilities. 1 loop line (232 m.). 2 short metal bridges.
748·4	COLOMB BÉCHAR	Alt. 2,569 ft. (783 m.). Watering facilities. Engine shed. 1 loop line (260 m.). Junction with normal-gauge line through Morocco from Oudjda and Bou Arfa.
770·1	KENADZA	Alt. 2,451 ft. (747 m.). 1 loop line (170 m.). Watering facilities. Engine shed. Coalmining centre (p. 249, Photos. 55, 109). Sidings for coal mines. Extension of normal-gauge line towards Beni Abbès in course of construction (p. 452).

9. MOSTAGANEM-RELIZANE-BURDEAU

Length

Mostaganem-Relizane	50 miles	80·5 kilometres
Relizane-Uzès-le-Duc	28 „	45 „
Uzès-le-Duc-Burdeau	77 „	124·7 „
	<u>155</u>	<u>250·2</u>

Branch lines

Relizane is the junction for an alternative line to Prévost-Paradol via Zemmora (Route 9 A).

Traction

Steam.

Permanent way

Gauge: narrow (1·055 m.). Single track. Minimum radius of curves, 100 m. Maximum up gradient, 1 in 40 Mostaganem (Marine)-Mostaganem (Ville), 1 in 45 in either direction Mostaganem (Ville)-Tiaret. Maximum distance between passing loops, Mostaganem-Relizane section: 16·2 km. (10 miles) Mekhalia-Bel Hacer; Relizane-Tiaret section: 25·5 km. (16 miles) Sidi Mohammed ben Aouda-Uzès-le-Duc. Minimum length of loop lines at stations, 133 m.

Speed and capacity

Overall time (approx.): 6 hrs. 30 min. Capacity of line, Mostaganem-Relizane section, 8 trains per day each way.

Miscellaneous

Engine sheds at Mostaganem (Ville), Relizane, and Tiaret.

GENERAL DESCRIPTION

This line links the coast with the main normal-gauge line from Oran to Algiers. It crosses the plateau of Mostaganem through a richly cultivated region and reaches the Oued Mina plain. From Relizane it follows the Oued Mina into the Ouarsenis, passing through a much poorer region until it emerges at Tiaret on to the plateau of Sersou, a fertile and well-colonized region, across which it continues to Burdeau. Hardy, 17 miles (27 km.) farther east, is served by a line (gauge 0.60 m.) from Burdeau.

DETAILED DESCRIPTION

<i>Distance in km. from Mostaganem</i>	<i>Stations</i>	<i>Remarks</i>
0.0	MOSTAGANEM (MARINE) (GARE MARITIME)	Alt. 7 ft. (2 m.). 1 loop line (170 m.). Station is situated behind the Quai Est. From here line runs south-westward behind the quay.
0.6	..	Tunnel (227 m.). Line continues south-westward for about 1 mile and then bends round to run north-eastward to the town station, rising on to the plateau, which has many sand-dunes which make maintenance difficult.
5.1	MOSTAGANEM (VILLE)	Alt. 390 ft. (119 m.). Watering facilities. Engine shed. 2 loop lines (412 m. and 192 m.). Junction with line to la Macta (Route 8). 2 short metal bridges.
8.4	PÉLISSIER	Alt. 450 ft. (137 m.). Halt. 1 loop line (192 m.).
14.0	TOUNIN MAZOURKA	Alt. 666 ft. (203 m.). Halt.
21.2	BEL HADRI	Alt. 676 ft. (206 m.). Halt. 1 loop line (133 m.).
26.0	AIN TÉDELÈS	Alt. 659 ft. (201 m.). Watering facilities. 1 loop line (213 m.).
36.7	OUED KHEIR	Alt. 755 ft. (230 m.). Watering facilities. 1 loop line (200 m.). Line crosses uncultivated plateau of red sands, and winds up forested (mastic and pine) massif of Larboube.
51.9	MEKHALIA	Alt. 778 ft. (237 m.). Watering facilities. 1 loop line (222 m.).
59.9	SIDI KHETAB	Alt. 394 ft. (120 m.). Halt.
68.1	BEL HACEL	Alt. 184 ft. (56 m.). 1 loop line (226 m.).
68.9	..	Bridge over Oued Mina (50 m.), metal.
80.5	RELIZANE	Alt. 223 ft. (68 m.). Watering facilities. Engine shed. 1 loop line (267 m.). Junction (separate stations) with normal-gauge line Oran-Algiers

<i>Distance in km. from</i>	<i>Stations</i>	<i>Remarks</i>
		(Route 7). Junction with narrow-gauge line to Prévost-Paradol via Zemmora (Route 9 A).
81.2	..	Bridge over road and Oran-Algiers railway line (80 m.), metal.
89.7	Oued KHELLOUG	Alt. 308 ft. (94 m.). Halt. 1 loop line (194 m.).
90.9	..	Short metal bridge over Oued Khelloug.
100.0	SIDI MOHAMMED BEN AOUDA	Alt. 410 ft. (125 m.). 1 loop line (196 m.). From here to Oued Tléta the line follows the valley of the Oued Mina. 5 metal bridges, the first 25 m., the others 35 m. long, over the Oued Mina at km. 100.8, 105.0, 106.2, 109.3, 111.0.
112.3	LES ANATRAS	Alt. 600 ft. (183 m.). Halt. 4 metal bridges (3 of 35 m. and 1 of 20 m.) over Oued Mina at km. 113.6, 115.1, 119.9, 121.4.
125.5	UZÈS-LE-DUC (FORTASSA)	Alt. 784 ft. (239 m.). Watering facilities. 1 loop line (230 m.).
133.3	..	Bridge over Oued Mina (20 m.), metal.
142.0	DJILALI BEN AMAR	Alt. 981 ft. (299 m.). Watering facilities. 1 loop line (194 m.). 2 metal bridges (each 20 m.) over Oued Mina at km. 145.2, 150.3. Line rises with steep gradients.
153.3	Oued TLÉTA	Alt. 1,247 ft. (380 m.). Watering facilities. 1 loop line (204 m.).
170.8	PRÉVOST-PARADOL (MECHRA SFA)	Alt. 2,244 ft. (684 m.). Watering facilities. 2 loop lines (265 m. and 220 m.). Junction with narrow-gauge line to Relizane via Zemmora (Route 9 A).
176.0	RAOUX	Alt. 2,319 ft. (707 m.). Halt.
181.5	AIN SAUB	Alt. 2,280 ft. (695 m.). Watering facilities. 1 loop line (201 m.). Line continues to rise with steep gradients and sharp curves.
185.7	SEFFALOU	Alt. 2,424 ft. (739 m.). Halt.
194.8	TAGDEMT	Alt. 2,700 ft. (823 m.). 1 loop line (202 m.). Bridge (50 m.), metal.
205.2	TIARET	Alt. 3,314 ft. (1,010 m.). Watering facilities. Engine shed. 1 loop line (230 m.).
210.2	FAIDHERBE	Alt. 3,281 ft. (1,000 m.).
215.2	TORRICH	Alt. 3,215 ft. (980 m.).
222.2	TRUMELET	Alt. 3,232 ft. (985 m.).
231.2	LES TROIS FERMES	Alt. 3,100 ft. (945 m.).
237.2	BOURLIER	Alt. 3,074 ft. (937 m.).
250.2	BURDEAU	Alt. 2,989 ft. (911 m.). From here the line continues to Hardy (277.2 km.) on a gauge of 0.60 m., passing the stations of Victor Hugo at km. 260.2 and Beni Zouilane at km. 264.2.

9 A. RELIZANE-ZEMMORA-PRÉVOST-PARADOL

Length

51 miles, 82 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1.055 m.). Single track. Maximum distance between stations, 13 km. (8 miles) Ouled Zid-Zemmora and Henri Huc-Montgolfier.

GENERAL DESCRIPTION

This line crosses the western end of the Ouarsenis massif, following the upper course of the Oued Menasfa between Zemmora and Montgolfier. The railway then follows the main road from Relizane to Tiaret, crossing and recrossing it several times. The line is now used for goods traffic only.

DETAILED DESCRIPTION

*Distance
in km.
from
Relizane*

*Stations**Remarks*

0	RELIZANE	Alt. 223 ft. (68 m.). Watering facilities. Engine shed. 1 loop line (267 m.). Junction with narrow-gauge line to Burdeau via Uzès-le-Duc (Route 9).
10	OULED ZID	Halt.
23	ZEMMORA	Alt. 945 ft. (288 m.). Line rises through forest-covered highland.
33	KENNENDA	Line crosses road from Zemmora to Tiaret.
40	MENDEZ	Alt. 1,575 ft. (480 m.). Line follows valley of Oued Menasfa.
50	HENRI HUC (OUED STEMME)	..
53	MONTGOLFIER	Agricultural centre.
63	LES FERMES	..
82	PRÉVOST-PARADOL (MECHRA SFA)	Alt. 2,244 ft. (684 m.). Watering facilities. 2 loop lines (265 m. and 220 m.). Junction with narrow-gauge line to Relizane via Uzès-le-Duc (Route 9).

10. MARENGO-EL AFFROUN

Length

12 miles, 19.2 kilometres.

Traction

Steam.

Permanent way

Gauge: normal (1.435 m.). Maximum up gradient, 1 in 48 Marengo-el Affroun, 1 in 50 el Affroun-Marengo. Minimum length of loop lines at stations, 190 m.

Miscellaneous

Engine sheds at el Affroun.

GENERAL DESCRIPTION

This was originally part of the narrow-gauge line between Cherchel and el Affroun, but the line from Cherchel to Marengo was closed in 1937, and the section from Marengo to el Affroun, on the Oran-Algiers main line, converted to normal gauge. There is now a bus service between Marengo and Cherchel on the coast. From Marengo to el Affroun the line follows the southern edge of the Mitidja plain.

DETAILED DESCRIPTION

<i>Distance in km. from Marengo</i>	<i>Stations</i>	<i>Remarks</i>
0.0	MARENGO	Alt. 266 ft. (81 m.). Watering facilities (public supply). Turntables (3.75 m.). 1 loop line (190 m.).
0.3	..	Bridge (10 m.), metal.
5.5	BOURKIKI	Alt. 331 ft. (101 m.). No stop signals.
14.1	AMEUR EL AIN	Alt. 338 ft. (103 m.). No stop signals.
18.2	..	Bridge over Oued Djer (35 m.), metal.
19.2	EL AFFROUN	Alt. 299 ft. (91 m.). Watering facilities (public supply). Turntable (17 m.). 3 sidings, each of 265 m. Engine shed. Junction with Oran-Algiers main line (Route 7).

11. BLIDA TO DJELFA

(Photos. 73, 111)

Length

Blida-Médéa	30 miles	49.2 kilometres
Médéa-Boghari	46 „	74.6 „
Boghari-Ain Oussera	35 „	57.0 „
Ain Oussera-Djelfa	61 „	97.6 „
	<hr/> 172	<hr/> 278.4

Traction

Steam.

Permanent way

Gauge: narrow (1.055 m.). Single track. Minimum radius of curves, 120 m. Maximum up gradient, 1 in 40 in both directions. Maximum distance between passing loops, Blida-Boghari section: 14 km. (8 miles) Mouzaia-les-Mines-Lodi; Boghari-Djelfa section, 45.8 km. (28 miles) Ain Sba-Ain Oussera. Minimum length of loop lines at stations, 136 m.

Speed and capacity

Overall time: passenger trains, 7 hrs. 16 min. Capacity of line, 4-6 trains per day each way.

Miscellaneous

Engine sheds at Blida, Médéa, Boghari, and Djelfa.

GENERAL DESCRIPTION

This is one of the main penetration lines of the desert. It connects the alfa steppe region with the main trans-Algerian railway, and also crosses the productive agricultural region round Médéa. From Blida the line rises into the Blida Atlas, following the valley of the Oued Chiffa southward. The river has cut a deep gorge through the well-wooded highland, and the road and railway follow this narrow valley (Photo. 111; Vol. I, Fig. 13). The railway passes through numerous tunnels and crosses the river many times; there are few villages. After leaving the gorge the line turns westward up another tributary to gain height, afterwards winding across the highland to Médéa, ascending all the way. The region between Médéa and Boghari is fertile and the villages are important agricultural centres. After a slight descent the line rises to its highest point in crossing the

ridge of highland separating the streams flowing to the Oued Isser from those flowing to the Oued Chélif. It descends again to Boghari, where the last ridges of the Tell Atlas are crossed. The remainder of the route from Boghari to Djelfa is across the High Plateaux. The line follows the main road (N. 1) through a region which is productive after heavy rain, but parched and barren in the hot season. From Ain Oussera the line crosses the alfa grass region with numerous depressions and areas of inland drainage. At Guelt es Stel it crosses the ridge of highland known as the Seba Rous, entering a region of sand-dunes which stretch along the northern edge of the Saharan Atlas and are constantly moved by the wind. It then descends to the foot of Djebel Sahari, where it enters the valley of the Oued el Melah, and rises across the thinly wooded northern slopes of the Monts des Ouled Nail to Djelfa.

Serious difficulties were involved in the construction of this line, and there are many engineering works, including at least twenty-four tunnels, most of them within the first 65 miles. These involve expense and difficulty in repairing and renewing stretches of the line. In the southern part drifting sand sometimes causes trouble.

DETAILED DESCRIPTION

<i>Distance in km. from Blida</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BLIDA	Alt. 692 ft. (211 m.). Watering facilities (public supply). Engine shed. Turntable (24 m.). 1 loop line (195 m.). Junction with Oran-Algiers main line (Route 7) (separate stations). Line descends to valley of Oued Chiffa.
4.0	..	Bridge over Oued el Kebir (40 m.), metal.
6.4	..	Bridge over Oued Chiffa (271 m.), metal. Line ascends with numerous embankments and sharp curves. 2 metal bridges (23 m. and 18 m.) are crossed.
10.2	..	Tunnel (212 m.).
11.3	SIDI MADANI	Alt. 673 ft. (205 m.). 1 loop line (136 m.).
12.3	..	Tunnel (936 m.) (Photo. 111). Line crosses 2 short metal bridges and another tunnel (224 m.).
14.4	..	Tunnel (679 m.).
15.1	..	Bridge over Oued Chiffa (60 m.), metal (Photo. 73).
15.2	..	Tunnel (635 m.).
16.1	..	Tunnel (653 m.).
16.8	..	Tunnel (296 m.).

<i>Distance in km. from Blida</i>	<i>Stations</i>	<i>Remarks</i>
17.1	..	Bridge over Oued Chiffa (60 m.), metal. Line passes through 3 more short tunnels and over 1 short bridge.
18.7	CAMP DES CHÊNES	Alt. 1,138 ft. (347 m.). Watering facilities (well). 1 loop line (258 m.). End of the Chiffa gorge. Valley widens, but line continues to ascend with steep gradients. Between Camp des Chênes and Mouzaia-les-Mines there are 11 short metal bridges and 5 tunnels.
30.5	MOUZAIA-LES-MINES	Alt. 1,778 ft. (542 m.). Watering facilities (steam pump; well). 1 loop line (400 m.). 2 short bridges.
36.2	..	Tunnel (400 m.). 2 short bridges.
44.5	LODI	Alt. 2,848 ft. (868 m.). 1 loop line (400 m.). Line rounds south-west flank of Djebel Nador.
47.9	..	Tunnel (169 m.).
49.2	MÉDÉA	Alt. 3,038 ft. (926 m.). Watering facilities (motor pump). Engine shed. Turntable (10.3 m.). 1 siding (280 m.). 1 loop line (400 m.). Line crosses fertile region of vineyards and orchards round Médéa and continues east to Loverdo.
51.7	DAMIETTE	Alt. 2,972 ft. (906 m.). 1 loop line (400 m.). 2 short tunnels.
58.2	LOVERDO	Alt. 2,920 ft. (890 m.). 1 loop line (400 m.). Line gradually rises to its highest point beyond Ben Chicao, passing through 2 short tunnels, over a bridge, and through another short tunnel. Tunnel (539 m.). 2 more short bridges and a tunnel.
70.3	BEN CHICAO	Alt. 3,704 ft. (1,129 m.). Watering facilities (well). Turntable (6.2 m.). 1 loop line (400 m.).
72.0	..	Alt. 3,819 ft. (1,164 m.). Summit of line. Line crosses Chélif-Isser watershed, and makes wide bend to Berrouaghia.
72.7	..	Tunnel (92 m.).
73.1	..	Tunnel (91 m.).
		Short stone bridge at km. 74.0.
74.7	..	Tunnel (154 m.).
75.2	..	Tunnel (539 m.).
77.9	..	Tunnel (172 m.).
		2 short stone bridges at c. km. 76.0 and 78.3.
83.2	BERROUAGHIA	Alt. 3,041 ft. (927 m.). Watering facilities (motor pump). Turntable (6.2 m.). 1 siding (300 m.). 1 loop line (320 m.). Rich agricultural region.
95.0	BRAZZA	Alt. 2,392 ft. (729 m.). Watering facilities (well). Turntable (6.2 m.). 1 loop line (400 m.). Enters valley of Oued Akoum (tributary of Oued Chélif).

<i>Distance in km. from Blida</i>	<i>Stations</i>	<i>Remarks</i>
95.9	..	Bridge over Oued Touila (64 m.), metal.
98.9	..	Bridge over Oued Akoum (20 m.), stone.
103.6	TLÉTAT DES DOUAIRES	Alt. 2,190 ft. (664 m.). Watering facilities (well). 1 loop line (303 m.).
105.5	..	Bridge over Oued Akoum (45 m.), metal, followed by another short metal bridge and a short tunnel.
112.4	MOUDJEBEUR	Alt. 2,011 ft. (613 m.). 1 loop line (300 m.). Enters valley of Oued Chélif.
123.8	BOGHARI	Alt. 2,001 ft. (610 m.). Watering facilities (public supply). Engine shed. Turntable (14 m.). Sidings. 1 loop line (375 m.).
127.1	..	Bridge (15 m.), metal.
135.0	AIN SBA	Alt. 2,057 ft. (627 m.). Halt. No stop signals. 1 loop line (315 m.).
139.0	..	Tunnel (126 m.).
149.5	BOUGHZOUL	Alt. 2,096 ft. (639 m.). Halt. No signals. Line crosses a marshy depression. Short metal bridge.
165.0	EL KRACHEM	Alt. 2,129 ft. (649 m.). Halt. No stop signals.
180.8	AIN OUSSERA (PAUL CAZELLES)	Alt. 2,260 ft. (689 m.). Airfield to right of station. Watering facilities (motor pump). 1 loop line (310 m.). 2 sidings, each of 280 m. Line enters alfa steppe region of High Plateaux.
195.2	BOU CEDRAIA	Alt. 2,474 ft. (754 m.). Watering facilities (motor pump). 1 loop line (365 m.).
215.2	GUELT ES STEL	Alt. 3,019 ft. (920 m.). Watering facilities (well). 1 loop line (330 m.). Line crosses Seba Rous and enters Territoires du Sud, then descends to depression occupied by the Zahrez Chergui and Zahrez Gharbi, passing between the two.
226.8	HASSI BAHBAH	Alt. 2,920 ft. (890 m.). Watering facilities (motor pump). 1 loop line (375 m.).
241.2	EL MESRANE	Alt. 2,835 ft. (864 m.). Halt. No stop signals. Vegetation very sparse.
249.3	ROCHER DU SEL	Alt. 2,949 ft. (899 m.). Watering facilities (well). 1 loop line (300 m.). Line enters valley of Oued Melah. Line continues to rise, but gradient not heavy.
262.4	SMILA	Alt. 3,350 ft. (1,021 m.). Halt. No stop signals. 2 short bridges.
278.4	DJELFA	Alt. 3,389 ft. (1,133 m.). Watering facilities (motor pump). Engine shed. Turntable (14 m.). 1 loop line (360 m.).

12. ALGIERS-CONSTANTINE-GHARDIMAOU (TUNISIA)

(Photos. 83, 112, 113, 115, 122)

Length

Algiers-Ménerville	34 miles	53·7 kilometres
Ménerville-Beni Mansour	73 „	117·5 „
Beni Mansour-Constantine	181 „	292·3 „
Constantine-Duvivier	102 „	163·5 „
Duvivier-Souk Ahras	32 „	52 „
Souk Ahras-Ghardimaou	36 „	58·3 „
	<u>458</u>	<u>737·3</u>

Branch lines

The normal-gauge line to Tizi Ouzou (Route 13) leaves at Ménerville, mile 34 (km. 53·7); that to Bougie (Route 14) at Beni Mansour, mile 107 (km. 171·2); that to Biskra and Touggourt (Route 16) at el Guerrah, mile 265 (km. 426·4); that to Tébessa (Route 17) (narrow gauge) at Ouled Rahmoun, mile 271 (km. 435·9); that to Bône (Route 19) at Duvivier, mile 390 (km. 627), and that to Oued Kéberit and Tébessa (Route 21) at Souk Ahras, mile 422 (km. 679).

Traction

Steam. Electric between Duvivier and Souk Ahras.

Electrification

For details, see pp. 346-347.

Permanent way

Gauge: normal (1·435 m.). Double track: Algiers-Maison Carrée, le Khroub-Constantine; single track: Maison Carrée-le Khroub, le Khroub-Ghardimaou. Maximum axle load, Ménerville-Constantine 20 tons, Duvivier-Souk Ahras 20 tons, Souk Ahras-Ghardimaou 13 tons. Minimum radius of curves, Maison Carrée-Constantine 300 m., le Khroub-Guelma 300 m., Guelma-Duvivier 300 m., Duvivier-Ghardimaou 250 m. Maximum up gradient, 1 in 44 Algiers-Constantine, 1 in 50 Constantine-Algiers, 1 in 40 le Khroub-Ghardimaou in each direction. Maximum distance between passing loops, 24·4 km. (15 miles) Dra el Mizane-Bouira. Minimum length of loop lines at stations, 157 m.

Speed and capacity

Overall time of fastest passenger service (including stops): passenger trains, Algiers-Constantine 8 hrs. 57 min., Constantine-Algiers 8 hrs. 23 min. Capacity of line, 10 trains per day each way.

Miscellaneous

Marshalling yards at Algiers, Sidi Mabrouk, Constantine, Guelma, and

Souk Ahras. Locomotive repair shops at Sidi Mabrouk and Souk Ahras. Engine sheds at Algiers, Ménerville, Bougie, Beni Mansour, Bordj bou Arréridj, Sétif, el Guerrah, Sidi Mabrouk, Guelma, Duvivier, Souk Ahras, and Ghardimaou.

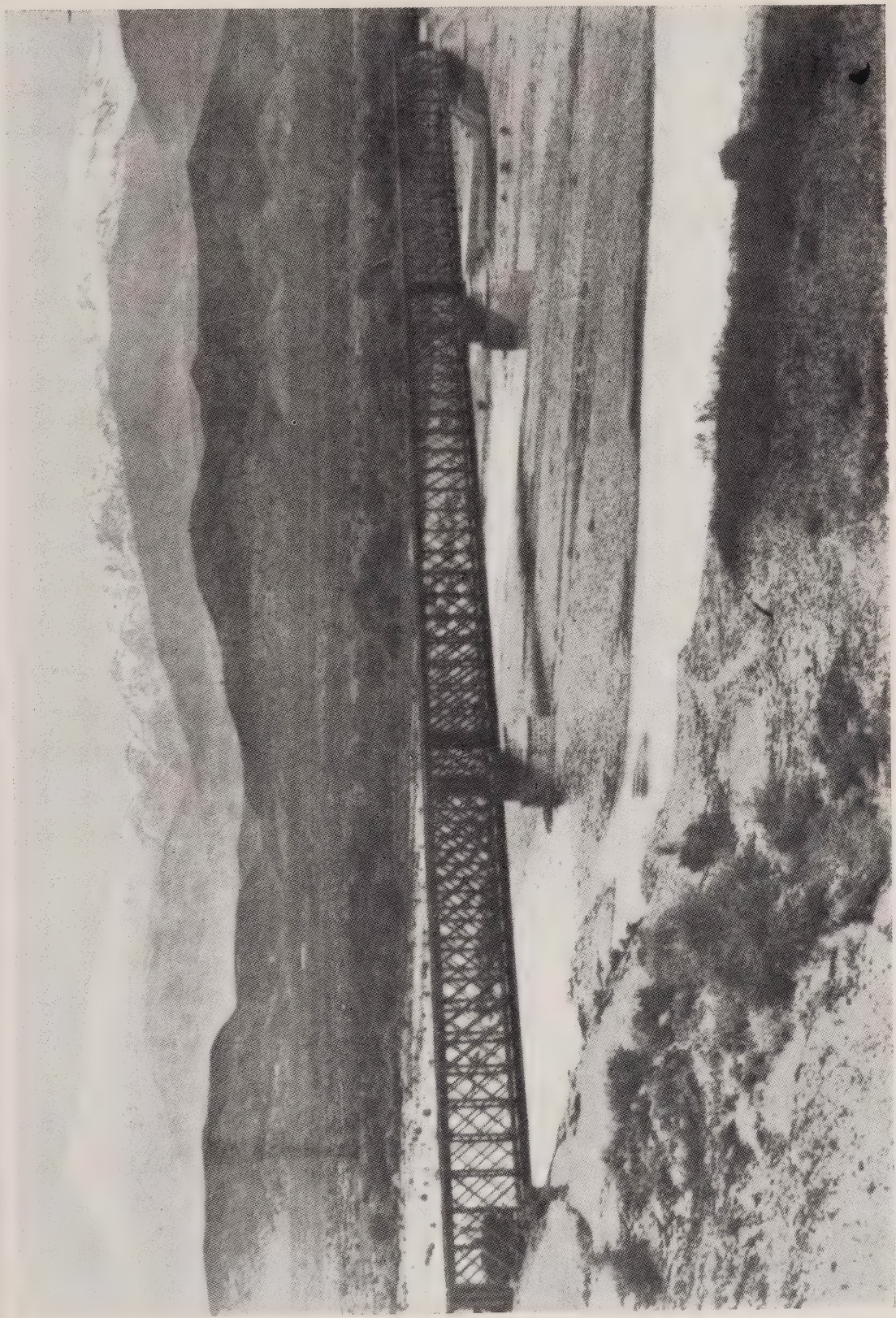
GENERAL DESCRIPTION

This line forms part of the main trunk route across Algeria from west to east, crossing the Atlas ranges from the coast at Algiers to the Tunisian plain. It follows the coast of the Baie d'Alger to Hussein Dey, where it turns inland and then eastward across the low-lying, fertile region of the Mitidja to Ménerville. Here the line enters the highland region, and, following the valley of the Oued Isser, runs southward through the gorge cut by this river and then turns south-east, still following the river valley. The line crosses the ridge of highland separating the Oued Isser valley and the valley of the Oued el Dous, later known as the Oued Sahel. It follows this valley round the southern edge of Djebel Djurdjura to Beni Mansour, beyond which it turns south into more difficult and mountainous country, crossing the Biban chain by the Portes de Fer, and eventually emerging on to the flat and monotonous Medjana plain, a western prolongation of the Sétif plateau. Between Bordj bou Arréridj and Sétif the mining districts south of the line are served by short branch lines. At Sétif the line reaches its highest point, and from there descends gradually to Constantine, following the valley of the Oued bou Merzoug into the town. The track is doubled between le Khroub and Constantine, as all trains between Algiers and Ghardimaou go into the town and back again to le Khroub. From here the line continues through highland, following the valleys of the Oued Zenati and Oued bou Hamdane, and reaches Duvivier by the valley of the Oued Seybouse. From Duvivier to Souk Ahras the line is electrified and consequently its capacity is much greater (Photo. 122). There are steep gradients, numerous tunnels, and many curves and zigzags. This was a very difficult and costly section to build, but is one of the most picturesque parts of the whole line. The highland is well forested, but the forest thins out near Souk Ahras. From here the line continues across highland into Tunisia. The country is difficult and the line passes along narrow gorges by means of numerous tunnels. It reaches the valley of the Oued Medjerda, which it follows, descending all the way, to Ghardimaou. The mountain sides which rise steeply from the narrow valley are wooded with mastic, pine, and olives.

DETAILED DESCRIPTION

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
0.0	ALGIERS	For line between Algiers and Maison Carrée, see p. 369 (Route 7).
10.3	MAISON CARRÉE	Junction with main line to Oran (Route 7).
11.2	..	Bridge over Oued Harrach (80 m.), metal. Several short bridges.
15.2	OUED SMAR	Alt. 46 ft. (14 m.). Halt. 1 loop line. Short bridge.
18.9	MAISON BLANCHE	Alt. 52 ft. (16 m.). Watering facilities (steam pump). 1 loop line (569 m.). 1 loop siding.
21.4	..	Bridge over Oued el Hamiz (62 m.), metal.
25.7	ROUIBA	Alt. 59 ft. (18 m.). 1 loop line (565 m.). 2 loop sidings.
31.1	REGHAIA	Alt. 53 ft. (16 m.). 1 loop line (578 m.). Line passes through forested country, mainly cork oak.
38.6	L'ALMA	Alt. 49 ft. (15 m.). Watering facilities (steam pump). 1 loop line (656 m.). 2 loop sidings. Line rises with gradients of 1 in 50.
38.8	..	Bridge over Oued bou Douaou (35 m.), metal.
41.4	CORSO	Alt. 108 ft. (33 m.). 1 loop line (589 m.). 1 loop siding.
42.7	..	Bridge (35 m.), metal.
44.2	..	Viaduct, arches 3 × 5 m.
45.9	ALLÉLIGUIA	Alt. 197 ft. (60 m.). Halt. No stop signals.
46.9	..	Viaduct, arches 3 × 7 m., stone.
48.4	BELLE FONTAINE	Alt. 233 ft. (71 m.). 1 loop line (586 m.). 1 loop siding.
52.7	..	Viaduct, arches 3 × 12 m., stone.
53.7	MÉNERVILLE	Alt. 443 ft. (135 m.). Watering facilities (public supply). Engine shed. 2 turntables (23.5 m. and 14 m.). About 7 loop sidings. Passing loop (probably ample length). Dead-end sidings. Assisting engine in steam. Reserve engine out of steam. Junction with line east to Tizi Ouzou (Route 13). Line passes through narrow valley between Djebel bou Arous and Djebel bou Zegza from the Mitidja plain to the Grande Kabylie.
53.8	..	Tunnel (156 m.).
58.6	..	Tunnel (135 m.).
60.2	SOUK EL HAD	Alt. 328 ft. (100 m.). 1 loop line (566 m.). 1 loop siding. Line ascends valley of Oued Isser to Thiers. 2 short tunnels (223 m. and 110 m.) at km. 61.1 and 63.1.
64.2	BENI AMRAN	Alt. 354 ft. (108 m.). 1 loop line (416 m.). 1 loop siding.
64.8	..	Bridge (67 m.), metal.

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
65.4	..	Tunnel (154 m.).
65.5	..	Bridge (140 m.), metal.
67.2	BENI AMRAN	Halt. Stop signals.
	GORGES	Line enters Isser gorge, which in one part is only 84 m. (276 ft.) wide.
		Numerous cuttings and embankments.
67.3	..	Bridge over Oued Isser (140 m.). 3 lattice-girder steel spans with 2-arch masonry approaches at each end (Photo. 112).
		8 tunnels, total length <i>c.</i> 2,660 m.
71.9	..	Viaduct, arches 3 × 10 m., stone.
72.3	PALESTRO GORGES	Halt. No stop signals.
72.6	..	Bridge (40 m.), metal.
74.6	..	Bridge over road N. 5 (140 m.), metal.
76.7	PALESTRO	Alt. 489 ft. (149 m.). Watering facilities (public supply). 1 loop line (311 m.). 2 loop sidings. Line ascends to Bouira.
77.0	..	Tunnel (142 m.).
77.3	..	Tunnel (98 m.).
		5 short bridges at km. 78.5, 78.8, 79.7, 82.2, 85.6.
87.3	THIERS	Alt. 620 ft. (189 m.). 1 loop line (274 m.). 1 loop siding.
98.2	DRA EL MIZANE	Alt. 778 ft. (237 m.). Watering facilities (steam pump). 3 loop sidings. 1 loop line (376 m.). Line follows valley of Oued Djemaa in general, but makes several large bends to gain height. Steep gradients.
106.8	..	Bridge (87 m.), metal.
107.0	..	Bridge (87 m.), metal.
111.4	..	Tunnel (293 m.).
		2 short bridges at km. 112.0, 112.2.
112.3	..	Tunnel (934 m.).
113.4	..	Tunnel (75 m.).
114.2	..	Tunnel (113 m.).
116.2	..	Bridge (40 m.), metal.
118.2	..	Tunnel (434 m.).
		Line reaches Hamza plain skirting southern edge of Djebel Djurdjura.
122.6	BOUIRA	Alt. 1,696 ft. (517 m.). Watering facilities (steam pump). Engine shed. Turntable (23.5 m.). 1 loop line (364 m.). 2 loop sidings. Several dead-end sidings. Reserve engine out of steam.
		Line runs through olive groves and between mountain slopes covered with pines. General descent, gradients of 1 in 67 and 1 in 100.
130.1	..	Bridge over Oued el Dous (64 m.), metal (Photo. 113).



113. Railway bridge over Oued el Dous near Bouira: Djurdjura in background (Route 12)



114. *Bridge over Oued Dehous, near Haussonviller (Route 13)*



115. *Road and railway leaving the Portes de Fer, south of Beni Mansour (Route 12)*

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
136.6	EL ESNAM	Alt. 1,624 ft. (495 m.). 1 loop line (478 m.). 1 loop siding. 1 dead-end siding.
141.5	..	Bridge (80 m.), metal.
142.6	BECHLOUL	Halt. No stop signals.
150.2	EL ADJIBA	Alt. 1,273 ft. (388 m.). Watering facilities (steam pump). 1 loop line (320 m.). 1 loop siding. 1 dead-end siding. 2 short bridges at km. 150.3, 155.6.
161.6	MAILLOT	Alt. 1,109 ft. (338 m.). 1 loop line (265 m.). 1 loop siding.
162.8	..	Bridge, arches 3 × 10 m., stone.
170.8	..	Bridge (70 m.), metal.
171.2	BENI MANSOUR	Alt. 948 ft. (289 m.). Watering facilities (electric pump). Engine shed (2 tracks). Turntable (23.5 m.). 1 loop line (378 m.). 3 loop sidings (600 m. each). Reserve engine out of steam. Junction with line to Bougie (Route 14).
174.7	..	Bridge (130 m.), metal.
175.2	..	Tunnel (67 m.).
175.4	..	Bridge, arches 3 × 15 m., stone.
175.6	..	Tunnel (72 m.).
177.2	..	Bridge, arches 7 × 15 m., stone.
181.9	..	Bridge, arches 5 × 8 m., stone.
182.1	..	Tunnel (356 m.).
185.0	LES PORTES DE FER	Alt. 1,335 ft. (407 m.). 1 loop line (409 m.). 1 loop siding. 3 short bridges at km. 185.3, 185.5, 185.9.
187.1	..	Bridge (37 m.), stone.
187.6	..	Bridge, arches 3 × 12 m., stone.
188.3	..	Viaduct, arches 15 × 8 m., stone (Photo. 115). 3 bridges (30 m., 3 × 8 m., and 5 m.) at km. 188.8, 189.3, 190.2.
191.0	OUED ALI	Alt. 1,513 ft. (461 m.). Halt. No stop signals. 5 short stone bridges at km. 192.2, 192.4, 193.9, 194.9, 199.6.
200.2	MZITA	Alt. 1,811 ft. (552 m.). 1 loop line (397 m.). 1 loop siding. Line rises with gradient of 1 in 43 to km. 222.5.
201.0	..	Bridge, arches 3 × 10 m., stone. 2 short metal bridges at km. 201.9, 204.5.
209.0	MANSOURA	Alt. 2,261 ft. (689 m.). Watering facilities (well). Turntable (14 m.). 1 loop line (364 m.). 1 loop siding. 3 dead-end sidings. Between km. 209 and km. 217, 16 bridges under 40 m. in length, mainly stone with 3 short arches.
217.5	..	Bridge, arches 3 × 10 m. + 2 × 6 m., stone.
219.1	..	Bridge, arches 3 × 10 m., stone.
220.2	..	Tunnel (2,250 m.) under Teniet el Merdj (alt. 3,304 ft.; 1,007 m.).

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
225.6	EL ACHIR	Alt. 3,204 ft. (977 m.). 1 loop line (566 m.). 1 loop siding. Line reaches Medjana plain and continues generally on a downward grade through rather arid region.
238.4	BORDJ BOU ARRÉRIDJ	7 short bridges between km. 226.0 and 237.0. Alt. 2,959 ft. (902 m.). Watering facilities (public supply). Turntable (23.5 m.). Engine shed. 1 loop line (433 m.). 4 loop sidings. 1 dead-end siding. Assisting engine in steam. Reserve engine out of steam.
245.2	GALBOIS- EL ANASSER	4 short bridges at km. 238.7, 239.0, 241.2, 244.5. Alt. 2,986 ft. (910 m.). 1 loop line (443 m.). 2 loop sidings. Line continues on upward grade.
254.0	CHÉNIA-CEREZ	2 small stone bridges at km. 246.7, 252.3. Alt. 3,254 ft. (992 m.). 1 loop line (456 m.). 1 loop siding.
263.2	AIN TASSERA (LAVOISIER)- LA BARBINAIS	2 small stone bridges at km. 256.0, 258.2. Alt. 3,399 ft. (1,036 m.). 1 loop line (475 m.). 4 loop sidings. Line continues downward (gradient 1 in 67) to le Hammam.
271.0	TIXTER- TOCQUEVILLE	Short line south to phosphate-mining centre of Tocqueville (p. 248). Alt. 3,133 ft. (955 m.). 1 loop line (561 m.). 2 loop sidings.
283.0	LE HAMMAM	4 short bridges at km. 274.0, 275.0, 275.8, 277.1. Alt. 2,906 ft. (886 m.). Watering facilities (steam pump). 1 loop line (586 m.). 1 loop siding.
283.3	..	Line ascends (gradient 1 in 67) to Sétif. Bridge over Oued bou Sellam (30 m.), metal.
285.5	OULED YELLIS	Alt. 2,933 ft. (894 m.). Halt. No stop signals. 2 short bridges at km. 285.6, 294.1, the second over the Oued bou Sellam.
296.2	MEZLOUG	Alt. 3,091 ft. (942 m.). 1 loop line (540 m.). 1 loop siding.
308.0	SÉTIF	Short metal bridge at km. 296.4. Alt. 3,524 ft. (1,074 m.). Summit of line. Watering facilities (public supply). Engine shed. Turntable (23.5 m.). 1 loop line (553 m.). 4 loop sidings. Dead-end sidings.
321.6	CHASSELOUP LAUBAT	4 short bridges at km. 308.8, 312.7, 317.4, 318.5. Alt. 3,261 ft. (994 m.). 1 loop line (587 m.). 1 loop siding.
338.8	ST. ARNAUD	6 short metal bridges at km. 323.0, 330.1, 330.2, 333.7, 335.0, 338.3. Alt. 3,117 ft. (950 m.). Watering facilities (steam

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
		pump). 1 loop line (600 m.). 1 siding (130 m.). 2 loop sidings. 4 dead-end sidings. 13 short metal bridges between km. 339 and km. 353.
353·5	BIR EL ARCH- NAVARIN	Alt. 3,077 ft. (938 m.). 1 loop line (615 m.). 1 loop siding (425 m.).
366·7	ST. DONAT	3 short metal bridges at km. 356·0, 357·0, 359·4. Alt. 2,815 ft. (858 m.). Watering facilities (steam pump). 1 loop line (576 m.). 1 loop siding (180 m.). 7 short metal bridges between km. 358·0 and km. 382·0.
383·4	MECHTA- CHÂTEAUDUN DU RUMMEL	Alt. 2,766 ft. (843 m.). 1 loop line (556 m.). 1 loop siding.
402·8	OUED SEGUIN- TÉLARGMA	3 short metal bridges at km. 391·7, 397·0, 401·2. Alt. 2,477 ft. (755 m.). Watering facilities (steam pump). 1 loop line (630 m.). 1 loop siding.
413·8	BERTEAUX-AIN LEHMA	3 short metal bridges at km. 405·2, 407·4, 412·4. Alt. 2,605 ft. (794 m.). 1 loop line (460 m.). 1 loop siding.
426·4	EL GUERRAH	2 short metal bridges at km. 422·1, 425·4. Alt. 2,477 ft. (755 m.). Watering facilities (public supply; steam and electric pumps). Engine shed. Turntable (14 m.). 1 loop line (455 m.). 1 loop siding (340 m.). 2 dead-end sidings to engine shed. Junction with line south to Biskra and Touggourt (Route 16). 1 loop line on Biskra branch. Reversing station for traffic from Algiers to Biskra.
435·9	OULED RAHMOUN	Line follows Oued bou Merzoug to Constantine. 3 short metal bridges at km. 426·7, 429·0, 431·0. Alt. 2,260 ft. (689 m.). Watering facilities (public supply and steam pump). Turntable (14 m.). 1 loop line (357 m.). 1 siding (422 m.). 3 loop sidings. Junction for narrow-gauge line to Ain Beida and Tébessa (Route 17). Terminal facilities.
447·8	LE KHROUB	5 short metal bridges between km. 442·0 and km. 447·4. Alt. 1,965 ft. (599 m.). Watering facilities (public supply and steam pump). Turntable (8·65 m.). Engine shed (4 tracks). Passing loop (500 m.). 2 loop sidings. 3 dead-end sidings. Junction with line north to Constantine and Philippeville (Route 15). Double-track line, le Khroub-Constantine. All passenger trains make the journey Algiers-Ghardimaou by Constantine. Trains running from Algiers to Ghardimaou must reverse.

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
452·1	OUED HAMIMIM	Alt. 1,906 ft. (591 m.). Halt. No stop signals.
452·9	..	Bridge, spans 2×7.5 m., metal.
459·2	..	Viaduct (140 m.) reinforced concrete (Bil Braguetz).
460·1	HIPPODROME	Alt. 1,929 ft. (588 m.). Halt. No stop signals.
461·2	SIDI MABROUK	Alt. 1,939 ft. (591 m.). Watering facilities (public supply). Engine shed (7 tracks). Turntable (35 m.). Several loop and dead-end sidings. Large locomotive workshops for normal and metre gauges. Important locomotive yard.
463·5	CONSTANTINE	Alt. 1,939 ft. (591 m.). Watering facilities (public supply). Turntable (14 m.). Several loop and dead-end sidings. (Photo. 83). Line continues north to Philippeville (Route 15). Main line to Ghardimaou returns to le Khroub.
480·0	LE KHROUB	(See above.) Line follows valley of Oued Berda on upward grade of 1 in 67, with Djebel Oum Settas to north. Road and railway run parallel.
495·0	BOU NOUARA	Alt. 2,346 ft. (715 m.). Passing loop (266 m.). Line skirting foot of Djebel Mazela.
506·0	AIN ABID	2 short bridges. Alt. 2,815 ft. (858 m.). Passing loop (265 m.). 1 loop siding. Line crosses col between Oueds Berda and Zenati, descending rapidly with gradients of 1 in 67 to Oued Zenati valley, and follows left bank of river.
521·0	AIN REGADA	5 short bridges between km. 510·0 and km. 520·0, the 2 longest crossing Oued Zenati.
533·0	OUED ZENATI	Alt. 2,346 ft. (715 m.). Watering facilities (steam pump). Passing loop (268 m.). 1 loop siding. Alt. 2,070 ft. (631 m.). Passing loop (161 m.). 2 dead-end sidings.
548·0	BORDJ SABBATH	3 short metal bridges at km. 541·3, 545·4, 546·6, over tributaries of Oued Zenati. Alt. 1,706 ft. (520 m.). Watering facilities (steam pump). Passing loop (271 m.). Line follows Oued bou Hamdane and Oued Seybouse through wooded country.
553·9	..	Short stone bridge followed by metal bridge (28 m.) over Oued Sabbath at km. 549·5.
559·0	TAYA	Bridge over Oued bou Hamdane (88 m.), metal. 2 stone viaducts, arches 4×6 m. and 3×6 m., at km. 554·6, 556·5. Alt. 1,342 ft. (409 m.). Watering facilities (well). Passing loop (267 m.). Short stone bridge over Oued bou Hamdane at km. 563·1. Viaduct, arches 5×10 m., stone.

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
		Bridge (25 m.) over Oued bou Hamdane (25 m.), metal, at km. 570.0.
574.1	HAMMAM	Alt. 991 ft. (302 m.). Watering facilities (steam pump). Passing loop (265 m.).
574.7	MESKOUTINE ..	Viaduct over Oued Chedakra, arches 6 × 10 m., stone.
578.3	..	Bridge over Oued bou Hamdane (64 m.), metal.
580.0	MEDJEZ AHMAR	Alt. 866 ft. (264 m.). Passing loop (201 m.). Line passes through olive groves and low wooded hills.
582.7	..	Bridge over Oued Seybouse (62 m.), metal.
593.7	GUELMA	Alt. 804 ft. (245 m.). Watering facilities (public supply). Engine shed (2 tracks). Turntable (23 m.). Permanent-way building. Passing loop (306 m.). 2 loop sidings. Dead-end sidings. Assisting engine in steam. Reserve engine out of steam.
597.2	MILLESIMO	Alt. 755 ft. (230 m.). Halt.
		Bridge over Oued Zimba (16 m.), metal, at km. 598.1 and viaduct over Oued Roidjel (38 m.) at km. 601.6.
601.9	PETIT	Alt. 617 ft. (188 m.). Passing loop (227 m.). 1 loop siding.
		Bridge (14 m.), metal, at km. 603.
607.5	..	Bridge over Oued Seybouse (80 m.), metal. Short bridge over marsh.
613.9	NADOR	Alt. 407 ft. (124 m.). Passing loop (281 m.). 1 loop siding.
		3 short bridges and 1 stone viaduct, arches 3 × 5 m. at km. 621.4, 622.0, 624.5, 626.5.
627.0	DUVIVIER	Alt. 312 ft. (95 m.). Watering facilities (steam pump). Engine shed (2 tracks). Turntable. Permanent-way building. 2 passing loops (266 m. and 275 m.). 5 loop sidings. 3 dead-end sidings. Assisting engine in steam. Reserve engine out of steam. Junction with line north to Bône (Route 19).
		Line rises rapidly (gradient 1 in 40), with sharp curves and zigzags. Section Duvivier-Souk Ahras is electrified.
627.6	..	Bridge over Oued Seybouse (100 m.), metal.
		2 metal bridges (each 40 m.) over Oued Melah at km. 634.7, 635.5, and metal bridge (35 m.) over Oued Sfa at km. 636.4.
636.8	MEDJEZ SFA	Alt. 374 ft. (114 m.). Watering facilities (public supply; tank). Passing loop (270 m.). 1 loop siding. Electric sub-station.
		Line continues with gradients of 1 in 40 and numerous sharp curves over next 25 km.

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
642.1	..	Tunnel (420 m.).
645.4	AIN TAHAMIMINE	Alt. 1,142 ft. (348 m.). Passing loop (330 m.). 1 loop siding.
646.6	..	Tunnel (196 m.).
647.0	..	Tunnel (80 m.).
647.9	..	Viaduct over Oued Cherf, arches 8 × 12 m., stone.
650.7	AIN AFFRA	Alt. 1,463 ft. (446 m.). Passing loop (255 m.). 2 loop sidings.
654.7	..	Tunnel (719 m.).
658.0	..	Tunnel (86 m.).
662.6	LAVERDURE	Alt. 2,365 ft. (721 m.). Watering facilities (well; tank). Passing loop (317 m.). 1 loop siding.
663.9	..	Tunnel (385 m.) through Fedj Makta mountain.
664.9	..	Tunnel (140 m.). Short stone viaduct, arches 3 × 8 m., at km. 665.7.
668.4	AIN SENNOUR	Alt. 2,402 ft. (732 m.). Passing loop (320 m.). 1 loop siding.
669.3	..	Viaduct over Oued Gamza, arches 8 × 12 m., stone.
678.3	..	Tunnel (125 m.).
679.0	SOUK AHRAS	Alt. 2,208 ft. (673 m.). Watering facilities (electric pump). Turntable (23 m.). Engine shed (round-house). Locomotive shops. Electric sub-station. Permanent-way building. Passing loop (420 m.). 7 loop sidings. Dead-end sidings. Assisting engine in steam. Reserve engine out of steam. Junction for line to Tébessa (Route 21). End of electrified section.
		Between Souk Ahras and Ghardimaou line descends abruptly (gradient 1 in 40), passing through numerous deep cuttings and following the Medjerda valley in a north-easterly direction.
679.5	..	Spiral tunnel (550 m.).
680.5	..	Junction with line south to Tébessa (Route 21).
682.1	..	Tunnel (250 m.).
		Viaduct over Oued Zecha and road, arches 7 × 12 m., stone.
685.3	..	Tunnel (215 m.).
686.4	..	Tunnel (60 m.).
686.9	..	Tunnel (190 m.).
687.3	..	Bridge over Oued Medjerda (60 m.), metal.
687.4	TARJA	Alt. 1,611 ft. (491 m.). Watering facilities (well). Passing loop (185 m.).
687.9	..	Tunnel (95 m.).
		3 metal bridges (2 of 60 m. and 1 of 50 m.) over Oued Medjerda at km. 689.2, 693.3, 694.2, and 1 stone bridge, arches 3 × 7 m., over tributary at km. 695.0.

<i>Distance in km. from Algiers</i>	<i>Stations</i>	<i>Remarks</i>
695·7	SIDI BADER	Alt. 1,499 ft. (457 m.). Passing loop (223 m.). 3 short metal bridges at km. 698·6, 699·7, 700·0.
702·5	..	Bridge over Oued Medjerda (117 m.), metal. Bridge (20 m.), metal, at km. 705·1.
705·2	KHEDARA	Alt. 1,309 ft. (399 m.). Halt. 2 dead-end sidings connected by loop.
709·0	..	Bridge over Oued Medjerda (75 m.), metal. Bridge, arches 3 × 7 m., stone, at km. 711·6.
711·8	Oued MOUGRAS	Alt. 1,171 ft. (357 m.). Watering facilities (steam pump). Passing loop (221 m.). 2 bridges over Oued Medjerda (60 m. and 75 m.), metal, at km. 712·5, 713·0. Short stone bridge over ravine at km. 714·6.
716·3	..	Tunnel (130 m.).
717·2	..	Tunnel (100 m.).
724·7	..	Bridge over Oued Medjerda (60 m.), metal.
724·8	..	Tunnel (210 m.).
726·3	..	Tunnel (190 m.).
727·5	SIDI EL HEMESSI	Alt. 856 ft. (261 m.). Halt. Watering facilities (well). Passing loop (218 m.). 2 bridges over Oued Medjerda (each 60 m.), metal, at km. 728·3, 729·9.
731·7	..	Frontier. 2 bridges over Oued Medjerda (55 m. and 58 m.), metal, at km. 731·8, 734·2.
737·3	GHARDIMAOU (TUNISIA)	Alt. 656 ft. (200 m.). Watering facilities (public supply). Passing loop (326 m.). Engine shed (4 tracks). Reserve engine out of steam.

13. MÉNERVILLE-TIZI OUZOU

(Photo. 114)

Length

34 miles, 54·3 kilometres.

Branch lines

The narrow-gauge line to Boghni (Route 13 A) leaves at Mirabeau, mile 26 (km. 42).

Traction

Steam.

Permanent way

Gauge: normal (1·435 m.). Single track. Minimum radius of curves, 300 m. Maximum up gradient, 1 in 33 Ménerville-Tizi Ouzou, 1 in

55 Tizi Ouzou–Ménerville. Maximum distance between passing loops, 12 km. ($7\frac{1}{2}$ miles) Bordj Menaiel–Haussonviller. Minimum length of loop lines at stations, 250 m.

Speed and capacity

Overall time: passenger trains, 1 hr. Capacity of line, 10 trains per day each way.

Miscellaneous

Engine sheds at Ménerville and Tizi Ouzou.

GENERAL DESCRIPTION

This is a short branch line from the main Algiers–Constantine line at Ménerville. It descends to the Isser valley, which it follows for about 5 miles, and runs in a general easterly direction, penetrating the northern part of the massif of the Grande Kabylie. The line rises into the highland following the Oued Chender, a tributary of the Oued Isser. After Haussonviller, which lies in the corridor leading from the valley of the Oued Isser to that of the Oued Sebaou, the line follows a tributary of the Oued Sebaou and, with a rather winding course through numerous tunnels and over viaducts, descends to Camp du Maréchal and the Oued Sebaou valley. To the south the mountain slopes are well wooded. From Camp du Maréchal the line follows the left bank of the Oued Sebaou, and then takes a sharp bend southward into the highland, rising steeply to avoid the gorge of the Oued Sebaou. Djebel Beloua, which is covered with woods and olive and fig groves, rises to the north of Tizi Ouzou.

DETAILED DESCRIPTION

<i>Distance in km. from Ménerville</i>	<i>Stations</i>	<i>Remarks</i>
0.0	MÉNERVILLE	Alt. 443 ft. (135 m.). Watering facilities (public supply). Engine shed. 2 turntables (23.5 m. and 14 m.). Passing loop (ample length). c. 7 loop sidings. Dead-end sidings. Junction with main line Algiers–Ghardimaou (Route 12).
6.3	FÉLIX FAURE- COURBET	Alt. 131 ft. (40 m.). 1 loop line (331 m.).
8.6	..	Bridge (90 m.), stone and metal.
9.0	..	Bridge over Oued Isser (130 m.), metal.
10.3	ISSERVILLE-LES- ISSERS	Alt. 98 ft. (30 m.). Watering facilities (public supply). 1 loop line (308 m.).
10.7	..	Bridge over Oued Djema (45 m.), metal.

<i>Distance in km. from Ménerville</i>	<i>Stations</i>	<i>Remarks</i>
15·2	BORDJ MENAIEL	Alt. 79 ft. (24 m.). 1 loop line (377 m.).
24·4	..	Bridge over Oued Randjour (96 m.), stone.
27·2	HAUSSONVILLER	Alt. 525 ft. (160 m.). 1 loop line (266 m.). Numerous curves and cuttings.
27·8	..	Tunnel (72 m.).
28·4	..	Tunnel (343 m.), curved.
29·1	..	Tunnel (278 m.).
29·7	..	Curved viaduct over Oued Dehous, 204 m. (17 arches) (Photo. 114). 2 viaducts (each 132 m.) at km. 30·2, 30·9.
31·2	..	Tunnel (144 m.).
34·2	..	Bridge (36 m.), stone.
35·6	CAMP DU MARÉCHAL	Alt. 180 ft. (55 m.). 1 loop line. Enters Oued Sebaou valley.
41·2	..	Bridge over Oued bou Gdoura (160 m.), metal.
42·1	MIRABEAU	Alt. 158 ft. (48 m.). Watering facilities (steam pump). 1 loop line (312 m.). Junction with narrow-gauge line south to Boghni (Route 13 A).
44·3	..	Bridge over Oued Sebt (80 m.), metal. Line leaves valley of Oued Sebaou, rising with gradient of 1 in 50 for 5 km. (3 miles).
49·6	GUYNEMER (BOUKHALFA)	Alt. 334 ft. (102 m.). Halt. No stop signals.
52·5	TIZI OUZOU (GARE)	Alt. 502 ft. (153 m.). Watering facilities (public supply). Engine shed. Turntable (14 m.). 1 loop line (287 m.). 1 siding (225 m.). Very steep gradient of 1 in 33 to Tizi Ouzou (Ville).
54·3	TIZI OUZOU (VILLE)	Alt. 620 ft. (189 m.). Halt. 1 loop line (287 m.).

Branch Line. 13 A. MIRABEAU-BOGHNI

Length

19 miles, 30·2 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1·00 m.). Single track. Maximum up gradient 1 in 48 Mirabeau-Boghni. Maximum distance between passing loops 12·5 km. (7 $\frac{3}{4}$ miles) Tlélat-Maatka. Minimum length of loop lines at stations, 80 m.

Speed and capacity

Overall time (including stops): passenger trains, 1 hr. 40 min. Capacity of line, 1 train per day each way.

GENERAL DESCRIPTION

This short line penetrates southward into the Grande Kabylie, following the valley of the Oued bou Gdoura and its tributaries, the Asif Tala and Asif Agouni, to Boghni, which lies in the depression on the northern side of Djebel Djurdjura. The line used to continue northward from Mirabeau to Dellys on the coast, but this part is now closed.

DETAILED DESCRIPTION

<i>Distance in km. from Mirabeau</i>	<i>Stations</i>	<i>Remarks</i>
0.0	MIRABEAU	Alt. 158 ft. (48 m.). Watering facilities. 2 loop lines (120 m. and 80 m.). 1 siding (177 m.). Junction with Ménerville-Tizi Ouzou line (Route 13). Line follows narrow valley through plantations of shrubs and cork oak.
7.3	TLÉLAT	Alt. 220 ft. (67 m.). 1 siding (90 m.).
19.8	MAATKA	Alt. 518 ft. (158 m.). Watering facilities. 1 siding (140 m.). Line skirts Bou Mahni forest, and climbs to Boghni with gradient of 1 in 48.
30.2	BOGHNI	Alt. 902 ft. (275 m.). Watering facilities. 1 siding (142 m.).

14. BOUGIE-BENI MANSOUR

Length

55 miles, 88.4 kilometres.

Traction

Steam.

Permanent way

Gauge: normal (1.435 m.). Single track. Minimum radius of curves, 240 m. Maximum up gradient, 1 in 83 Bougie-Beni Mansour, 1 in 100 Beni Mansour-Bougie. Maximum distance between passing loops, 12.4 km. (7 miles) la Réunion-el Kseur. Minimum length of loop lines at stations, 233 m.

Speed and capacity

Overall time (including stops): passenger trains, 2 hrs. 5 min. Capacity of line, 14-16 trains per day each way.

Miscellaneous

Engine sheds at Bougie and Beni Mansour.

GENERAL DESCRIPTION

This line follows the deep depression of the valley of the Oued Soummam, which separates the mountain masses of the Grande Kabylie and the Kabylie des Babors, and runs in a general south-westerly direction. The valley is fertile, well cultivated, and densely populated. The slopes, especially of the foothills, are planted with olive groves, carobs, and fig trees, and villages crown the summits. The valley floor, in contrast, with its scrub and waste land, is flooded each rainy season, and consequently the railway line generally runs on one or other side of the valley well above the river.

DETAILED DESCRIPTION

<i>Distance in km. from Bougie</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BOUGIE	Alt. 7 ft. (2 m.). Watering facilities (public supply). Engine shed. Turntable (17 m.). 1 loop line (393 m.). 2 loop sidings. Dead-end sidings. Sidings to quays. Assisting engine in steam. Reserve engine out of steam. Station near harbour. 6 short metal bridges between Bougie and km. 11. Vineyards on hill slopes.
11.6	LA RÉUNION	Alt. 52 ft. (16 m.). 1 loop line (254 m.). 1 loop siding.
12.9	..	Bridge (25 m.), metal. 3 short metal bridges at km. 13.6, 16.2, 19.2.
19.7	TOMBEAU DE LA NEIGE	Alt. 79 ft. (24 m.). Halt. No stop signals. 1 loop line. Vineyards become more common.
22.6	..	Bridge (36 m.), metal.
24.0	EL KSEUR-OUED AMIZOUR	Alt. 125 ft. (38 m.). Watering facilities (steam pump). 1 loop line (292 m.). 1 loop siding. 2 short metal bridges and 1 stone bridge at km. 24.2, 24.8, 25.5.
26.3	..	2 metal bridges (103 m.).
27.8	..	Tunnel (232 m.). 2 short metal bridges at km. 29.1, 30.3. Cable railway to iron mine at Timezrit (p. 239).

<i>Distance in km. from Bougie</i>	<i>Stations</i>	<i>Remarks</i>
31.7	EL MATEN	Alt. 20 ft. (63 m.). 1 loop line (273 m.). 3 loop sidings. Situated in plain of Tabouda. Valley narrows between Beni Himmel and forests of Akbou and Taourirt Ighil. 7 short metal and stone bridges between km. 34.0 and km. 40.0.
41.4	SIDI AICH	Alt. 308 ft. (94 m.). Watering facilities (steam pump). 1 loop line (273 m.). 1 loop siding. 1 dead-end siding.
42.2	..	2 bridges (103 m.), metal.
42.6	..	Viaduct, arches 20 × 8 m. 3 short metal bridges at km. 43.7, 44.4, 47.0. Line follows foot of Beni Ourlis.
47.1	TAKRIETS- SEDDOUK	Alt. 364 ft. (111 m.). 1 loop line (233 m.). 1 loop siding.
48.2	..	Tunnel (213 m.).
51.6	..	Bridge (30 m.), metal.
53.6	IGHZER AMOKRAN	Alt. 462 ft. (141 m.). 1 loop line (257 m.). 1 loop siding. 2 short metal bridges at km. 54.0, 55.9. 2 important side valleys lead to west and north-west.
58.0	AZIB BEN ALI CHÉRIF	Alt. 512 ft. (156 m.). Halt. No stop signals. 1 loop line. 3 short metal bridges at km. 58.5, 58.8, 59.4.
61.2	..	Metal bridge (25 m.) followed by 2 short bridges at km. 62.6, 63.6.
64.6	AKBOU	Alt. 604 ft. (184 m.). Watering facilities (steam pump). 1 loop line (297 m.). 1 loop siding. Town situated on height dominating Oued Soummam. 2 short metal bridges at km. 64.8, 67.1.
67.6	..	2 bridges (40 m.), metal. 5 short metal bridges between km. 68.0 and km. 75.0.
75.8	ALLAGHAN	Alt. 755 ft. (230 m.). 1 loop line (275 m.). 1 loop siding. 2 short metal bridges at km. 76.0, 79.5.
80.9	TAZMALT	Alt. 895 ft. (273 m.). 1 loop line (305 m.). 1 loop siding. 3 short metal bridges at km. 82.1, 83.2, 85.1.
85.5	..	Bridge (165 m.), metal.
88.4	BENI MANSOUR	Alt. 981 ft. (299 m.). Watering facilities (electric pump). Engine shed (2 tracks). Turntable (23.5 m.). 1 loop line (378 m.). 3 loop sidings (each 600 m.). Reserve engine out of steam. Junction with main Algiers-Tunis line (Route 12). Through running for Constantine-Bougie traffic. Reversing station for Algiers-Bougie traffic.

15. PHILIPPEVILLE-CONSTANTINE

Length

53 miles, 86·1 kilometres.

Branch line

The narrow-gauge line to Bône (Route 18) leaves at St. Charles, mile 11 (km. 18·8).

Traction

Steam.

Permanent way

Gauge: normal (1·435 m.). Single track. Minimum radius of curves, 200 m. Maximum up gradient, 1 in 50 Philippeville-Constantine, 1 in 59 Constantine-Philippeville. Maximum distance between passing loops, 13·9 km. (8 miles) Condé Smendou-Bizot. Minimum length of loop lines at stations, 270 m.

Speed and capacity

Overall time: passenger trains, 2 hrs. Capacity of line, 10 trains per day each way.

Miscellaneous

Marshalling yards at Constantine. Railway workshops at Philippeville-Faubourg. Engine sheds at Philippeville and Constantine.

GENERAL DESCRIPTION

This line crosses the ridge of highland lying between the coast and the Rummel valley. It follows the Safsaf valley into the highland and crosses the Monts de Constantine to reach the town of Constantine on the Oued Rummel. It is a most picturesque line winding through the narrow Safsaf valley between well-wooded mountains, and was one of the most expensive parts of the Algerian railway system to construct.

DETAILED DESCRIPTION

<i>Distance in km. from Philippeville</i>		<i>Stations</i>	<i>Remarks</i>
0·0		PHILIPPEVILLE	Alt. 7 ft. (2 m.). Watering facilities (public supply). Goods shed (good road access). End- and side-loading platforms. Engine shed. Turntable (14 m.). 1 loop line (503 m.). 5 loop sidings. 4 dead-end sidings. 4 dead-end sidings
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<i>Distance in km. from Philippeville</i>	<i>Stations</i>	<i>Remarks</i>
		on quay south of the Grande Darse, interconnected to sidings in yard by several turntables. 2 dead-end sidings on the Traverse Sud. Line continues west for short distance to serve electric power station. Assisting engine in steam.
0·4	..	Curved tunnel (835 m.) under Djebel Addouna (Mouader).
1·7	PHILIPPEVILLE- FAUBOURG	Alt. 26 ft. (8 m.).
1·9	..	Halt. No stop signals. Workshops (2 large buildings and round-house). Several dead-end sidings.
2·5	..	Bridge over Oued Zeramna (16 m.), stone.
5·5	DAMRÉMONT	Alt. 39 ft. (12 m.). Halt. 1 loop line. Valley narrows between well-wooded heights.
10·4	SAFSAF	Alt. 75 ft. (23 m.). 1 loop line (270 m.). Valley widens with road and railway side by side, running generally south-west.
18·8	ST. CHARLES	Alt. 128 ft. (39 m.). Watering facilities (electric pump). 1 loop line (340 m.). 1 loop siding. 2 dead-end sidings. Junction for narrow-gauge line east to Bône (Route 18). Forest thins out to scrub, and line climbs steeply from Safsaf valley to highland.
29·2	ROBERTVILLE- EL ARROUCH	3 short bridges at km. 19·3, 23·1, 27·4. Alt. 472 ft. (144 m.). 1 loop line (343 m.). 4 dead-end sidings. Serves 3 villages, Gastonville (4 km. east), Robertville (2 km. west), and el Arrouch (6 km. south). Steep ascent, frequently with gradients of 1 in 50. Most difficult part begins, with many engineering works.
36·1	BOUGRINA	Alt. 837 ft. (255 m.). Watering facilities (well). 1 loop line (335 m.). Line crosses barren highland, with many bends and steep gradients of 1 in 50.
45·8	COL DES OLIVIERS	Alt. 1,361 ft. (415 m.). Watering facilities (well). 1 loop line (312 m.). 1 loop siding. Situated between 2 valleys. Big hairpin bend. Road and rail follow one another closely and line ascends to ridge of el Kantour.
48·2	..	Tunnel (420 m.), Ste. Wilhelmine.
50·6	..	Tunnel (274 m.), Armée Française.
52·2	..	Tunnel (1,050 m.), el Kantour.
59·4	CONDÉ SMENDOU	3 short bridges at km. 56·2, 56·5, 57·2. Alt. 1,742 ft. (531 m.). Watering facilities (electric pump). 1 loop line (385 m.). 1 loop siding. 2 dead-end sidings.

<i>Distance in km. from Philippeville</i>	<i>Stations</i>	<i>Remarks</i>
		Short winding descent, then line ascends almost continuously.
59.5	..	Tunnel (220 m.).
63.2	..	Tunnel (96 m.), Petit Djebel Bulmas.
63.7	..	Tunnel (156 m.), Grand Djebel Bulmas.
65.9	..	Bridge (35 m.), metal, followed by 3 short bridges at km. 66.3, 72.2, 72.9.
73.3	BIZOT	Alt. 1,811 ft. (552 m.). 1 loop line (400 m.). 1 loop siding.
		2 short bridges at km. 75.3, 75.4.
79.7	LE HAMMA (HAMMA PLAISANCE)	Alt. 1,811 ft. (552 m.). 1 loop line (493 m.). 2 loop sidings. 1 dead-end siding. Line skirts cultivated Hamma basin.
82.9	..	Tunnel (229 m.), Petit M'Sid.
84.5	..	Tunnel (835 m.), Grand M'Sid.
86.1	CONSTANTINE	Alt. 1,939 ft. (591 m.). For details, see p. 392. (Route 12).

16. EL GUERRAH-TOUGGOURT

(Photos. 85, 116-121)

Length

El Guerrah-Batna	50 miles	80.5 kilometres
Batna-Biskra	75 "	120.6 "
Biskra-Touggourt	135 "	217 "
	260	418.1

Branch line

The narrow-gauge line to Tolga leaves at Oumache, mile 139 (km. 223.4).

Traction

Steam. Rail-cars also in use on this line (Photo. 121).

Permanent way

Gauge: normal (1.435 m.), el Guerrah-Biskra; narrow (1.00 m.), Biskra-Touggourt. Single track. Minimum radius of curves, 300 m. el Guerrah-Biskra; 220 m. Biskra-Touggourt. Maximum up gradient, 1 in 67 el Guerrah-Biskra, 1 in 63 Biskra-el Guerrah; 1 in 53 Biskra-Touggourt, 1 in 55 Touggourt-Biskra. Maximum distance between passing loops, on normal-gauge section 33 km. (21 miles) Batna-Ain Touta; narrow-gauge section, 36 km. (22 miles) Oumache-Chegga.

Minimum length of loop lines at stations, 230 m. (normal gauge), 180 m. (narrow gauge).

Capacity

Capacity of line (normal-gauge section), 4–6 trains per day each way; (narrow-gauge section), 4 trains per day each way.

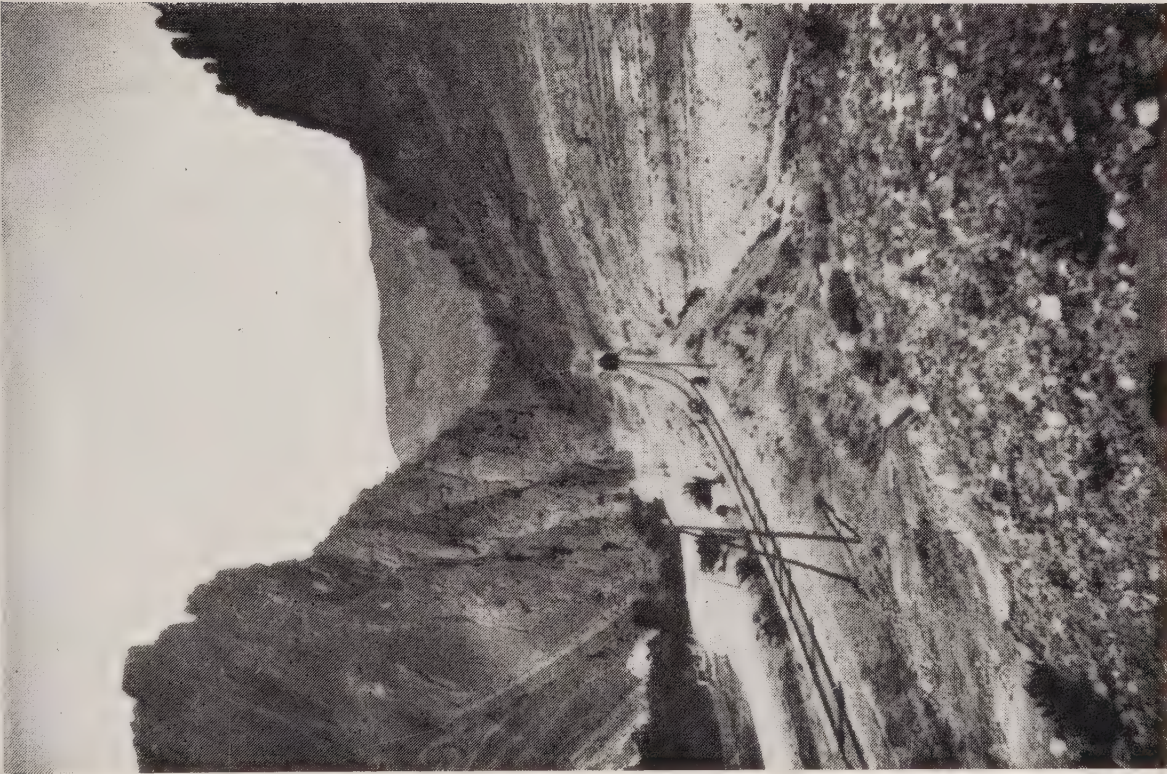
Miscellaneous

Engine sheds at el Guerrah, Batna, Biskra, Mraier, and Touggourt.

GENERAL DESCRIPTION

This is an important penetration line into the desert, crossing eastern Algeria from the Algiers–Ghardimaou line to the Territoires du Sud. After leaving el Guerrah the line traverses the undulating high plain of the Constantine chotts to Batna, following the same course as the main road, which it frequently crosses and recrosses. From Batna to Biskra is the most interesting part of the route, with highly varied scenery, especially through the Aurès. After leaving Batna the line passes between wooded highlands and soon reaches the summit of the line, descending from there to Biskra. Gradually the region becomes less wooded, and after passing les Tamarins station the line makes a big bend and enters the valley of the Oued Guebli. There are many cuttings, viaducts, and tunnels. At el Kantara the line passes through a defile, which is the gateway to the south through the eastern flank of the Aurès to the basin of the chotts, and opens on to a large oasis with 90,000 palm trees (Photos. 85, 116, 117). From here the line follows the valley of the Oued Kantara (later called the Oued Biskra), crossing and recrossing the river a number of times. Shortly before reaching Biskra the line winds round the edge of Djebel bou Ghezel and passes through rocky cuttings to reach Biskra.

At Biskra the line changes to narrow gauge (1.00 m.): the two stations are side by side. This section of the line is across desert and has little variety of scenery. Extensive sand-dunes occur, and the accumulation of sand along the line gives rise to difficulties of maintenance. Few engineering works have been necessary, the only bridge being that across the Oued Djedi. Other oueds are crossed by primitive structures which consist of causeways built on angular wire-netting containers filled with stones or shingle. Water supply is difficult in certain sections of this line, and in the region between Biskra and Touggourt is obtained from artesian wells. The water is saline and must be treated chemically before use.



116. Railway line and tunnel at southern end of
el Kantara gorge (Route 16)



117. Line entering el Kantara station from the
south (Route 16)



118. *Biskra station (Route 16)*



119. *Tolga station (Route 16)*

DETAILED DESCRIPTION

<i>Distance in km. from el Guerrah</i>	<i>Stations</i>	<i>Remarks</i>
0.0	EL GUERRAH	Alt. 2,477 ft. (755 m.). Watering facilities (public supply: steam and electric pumps). Turntable (14 m.). Engine shed. 1 loop line. 1 loop siding (340 m.). 2 dead-end sidings to engine shed. Junction with main line Algiers-Ghardimaou (Route 12). Reversing station for Algiers-Biskra traffic. Line follows valley of the Oued bou Merzoug between high mountains.
12.1	AIN MLILA	Alt. 2,529 ft. (771 m.). Watering facilities. 1 loop line (295 m.).
30.9	LES LACS	Alt. 2,592 ft. (790 m.). 1 loop line (285 m.). Station situated between Chott Tinecilt and Sebkha ez Zemoul. Line rises to the Col d'Ain Yagout.
47.1	AIN YAGOUT	Alt. 2,864 ft. (873 m.). 1 loop line (245 m.). Line enters valley of Oued el Madher.
53.7	..	Bridge over Oued el Madher (20 m.), metal.
55.3	FONTAINE CHAUDE	Alt. 2,726 ft. (831 m.). Halt. Watering facilities.
63.7	EL MADHER- PASTEUR	Alt. 2,854 ft. (870 m.). 1 loop line (270 m.).
69.7	FESDIS	Alt. 3,031 ft. (924 m.). Halt. Line skirts foot of forested Djebel Azeb.
72.9	..	Bridge over Oued el Madher (16 m.), metal.
80.5	BATNA	Alt. 3,366 ft. (1,026 m.). Watering facilities. Engine shed. 1 loop line (340 m.).
81.7	..	Bridge (26 m.), metal.
86.9	..	Summit 3,543 ft. (1,080 m.). Line descends on gradient of 1 in 63 to Biskra, following Oued Biskra valley between the Aurès on left and the Monts de Batna and Monts du Zab on right.
91.4	LAMBIRIDI	Alt. 3,507 ft. (1,069 m.). Halt.
97.5	VICTOR DURUY (RADJATI)	Alt. 3,415 ft. (1,041 m.). Halt.
113.5	MACMAHON (AIN TOUTA)	Alt. 2,982 ft. (909 m.). Watering facilities. 1 loop line (285 m.).
121.9	LES TAMARINS	Alt. 2,687 ft. (819 m.). 1 bridge and 3 short tunnels between km. 122.0 and km. 125.0.
125.7	..	Bridge (48 m.), stone.
127.7	..	Bridge (36 m.), stone.
128.6	..	Bridge (18 m.), stone.
128.8	MAAFA	Alt. 2,369 ft. (722 m.). Halt.
129.5	..	Bridge over Oued el Hai (25 m.), metal.
136.9	..	Bridge over Oued el Hai (25 m.), metal.
140.2	..	Bridge over Oued Sekroun (25 m.), metal, followed by similar bridge just before entering el Kantara.

<i>Distance in km. from el Guerrah</i>	<i>Stations</i>	<i>Remarks</i>
145·7	EL KANTARA	Alt. 1,765 ft. (538 m.). Watering facilities. 1 loop line (275 m.) (Photo. 117).
145·9	..	Bridge (50 m.), stone. Line enters el Kantara gorge, about 990 ft. (300 m.) long and 200 ft. (60 m.) wide, with rocks 400 ft. (120 m.) high on either side. Line built on a cornice above the river (Photo. 85). Several short bridges and tunnels between el Kantara and Fontaine des Gazelles (Photo. 116).
163·1	FONTAINE DES GAZELLES	Alt. 1,283 ft. (319 m.). Halt. Line enters desert region and follows valley of Oued Biskra.
163·3	..	Bridge over Oued Hassi ben Temtani (18 m.), stone.
168·9	..	Bridge over Oued Biskra (72 m.), metal.
169·2	..	Bridge over Oued Biskra (72 m.), metal.
170·9	..	Bridge over Oued Felleg (18 m.), stone.
173·9	EL OUTAYA	Alt. 902 ft. (275 m.). 1 loop line (230 m.).
179·1	..	Bridge over Oued Biskra (111 m.), metal. Shortly before next halt line crosses another metal bridge (20 m.).
183·8	FERME DUBOURG	Alt. 715 ft. (218 m.). Halt.
184·8	..	Bridge over Oued bou Gatou (42 m.), metal.
188·9	DAR AROUS	Halt. 2 bridges over Oued Biskra (12 m. and 72 m.), metal. Line passes eastern end of Djebel bou Ghezal, then through several deep cuttings and over heavy gradients.
201·1	BISKRA	Alt. 400 ft. (122 m.). Watering facilities. Engine shed. 1 loop line (430 m.). Change to narrow-gauge line (adjoining stations) (Photo. 118). Irrigated and cultivated land succeeded by steppe.
216·0	..	Line enters dune country of Ain Deba, and crosses main route to Touggourt, which it follows.
223·4	OUMACHE	Alt. 154 ft. (47 m.). Watering facilities. 1 loop line (370 m.). Junction with line west to Tolga.

Branch Line to Tolga

0	OUMACHE	..
15	MLILI-OURLAL	Palm groves. Distances from Oumache.
21	BEN THIOUS	Halt.
29	LICHANA-BOU CHAGROUN	Halt.
35	TOLGA	Large village in centre of great oasis (Photo. 119).

<i>Distance in km. from el Guerrah</i>	<i>Stations</i>	<i>Remarks</i>
226·1	..	Bridge over Oued Djedi (300 m.), steel, 6 spans. Line continues across flat, monotonous steppe land (Photo. 121).
259·6	CHEGGA	Alt. 49 ft. (15 m.). Watering facilities. 1 loop line (290 m.).
279·8	STIL	Alt. 26 ft. (8 m.). Halt. 1 loop line (210 m.). After passing Kef ed Dor ridge of highland the line approaches the chotts Melghir and Merouane.
309·5	OURIR	Alt. 62 ft. (19 m.) below sea-level. Halt. 1 loop line (180 m.). Oasis of 26,000 palm trees. Line ascends valley of Oued Rir.
317·5	MRAIER	Alt. 3 ft. (1 m.). Watering facilities. Engine shed. 1 loop line (255 m.) (Photo. 120). Oasis of 180,000 palm trees, watered by numerous artesian wells.
321·0	..	Dunes near Oued Dokkara.
331·0	SIDI KHELIL	Alt. 46 ft. (14 m.). Halt. 1 loop line (185 m.). Oasis of 30,000 palm trees.
344·9	EL BERD	Alt. 154 ft. (47 m.). Halt. 1 loop line (189 m.). Near dunes of fine sand.
353·2	EL ARFIANE	Alt. 79 ft. (24 m.). Halt. 1 loop line (222 m.).
365·4	DJAMA	Alt. 125 ft. (38 m.). Watering facilities. 1 loop line (334 m.). Village and oasis to east. Country increasingly sandy, and dunes alternate with chotts. Oases become more numerous.
376·6	TAMERNA	Alt. 164 ft. (50 m.). 1 loop line (233 m.).
387·9	SIDI RACHED	Alt. 194 ft. (59 m.). Halt. Olive groves have been invaded by sand and replanted.
399·0	MOGGAR	Alt. 181 ft. (55 m.). 1 loop line (245 m.).
409·3	MEGGARINE	Alt. 194 ft. (59 m.). Halt. 1 loop line (185 m.).
418·1	TOUGGOURT	Alt. 220 ft. (67 m.). Watering facilities. Engine shed. 1 loop line (250 m.). Sand-dunes. Cultivation in irrigated area.

17. OULED RAHMOUN-TÉBESSA

Length

121 miles, 195·2 kilometres.

Branch line

The line to Khenchela leaves at Oulmène, mile 63 (km. 101·8).

Traction

Steam.

Permanent way

Gauge: narrow (1.00 m.). Single track. Maximum distance between passing loops, 26.9 km. (17 miles) Canrobert-Ain Beida. Minimum length of loop lines at stations, 108 m.

Speed and capacity

Overall time (including stops): 8 hrs. 23 min. Capacity of line, 8 trains per day each way.

Miscellaneous

Engine sheds at Ouled Rahmoun and Ain Beida.

GENERAL DESCRIPTION

This narrow-gauge line is chiefly concerned with the transport of minerals, and is no longer in use for general passenger traffic. From Ouled Rahmoun the line runs in a south-easterly direction, following the road from Constantine to Ain Beida, over an elevated plateau which is generally above 2,000 feet in height. From Ain Beida the line continues across the plateau at the foot of ridges of highland to Tébessa. Tébessa is an important route-centre and is linked by mineral lines with the mines in the district.

DETAILED DESCRIPTION

<i>Distance in km. from Ouled Rahmoun</i>	<i>Stations</i>	<i>Remarks</i>
0.0	OULED RAHMOUN	Alt. 2,260 ft. (689 m.). Watering facilities (public supply; steam pump). Engine shed. Turntable (12 m.). 1 loop line (108 m.). Junction with Algiers-Ghardimaou line (Route 12).
1.0	..	Bridge over Oued bou Merzoug (15 m.), metal, followed by another metal bridge (25 m.).
6.5	SILA	Alt. 2,395 ft. (730 m.). Halt. No stop signals.
11.0	SIGUS	Alt. 2,520 ft. (768 m.). 1 loop line (300 m.). 1 siding (86 m.). Narrow valley leads to the Bahira and Touila plain.
15.5	..	Bridge over Oued Keleb (15 m.), metal.
20.6	TAXAS	Alt. 2,641 ft. (805 m.). Watering facilities (steam pump). 1 loop line (304 m.). Gradients increase and line winds.

<i>Distance in km. from Ouled Rahmoun</i>	<i>Stations</i>	<i>Remarks</i>
32·7	AIN FAKROUN	Alt. 3,031 ft. (924 m.). 1 loop line (300 m.). Line crosses Col d'Ourkis (alt. 3,280 ft., 1,000 m.). Summit of line.
48·0	ARMANDY (OURKIS)	Alt. 3,169 ft. (966 m.). Watering facilities (well). 1 loop line (304 m.). 1 siding (218 m.).
58·7	BIR DJEDIDA	Alt. 2,969 ft. (905 m.). Halt. No stop signals.
65·2	CANROBERT	Alt. 3,031 ft. (924 m.). Watering facilities (well). 1 loop line (310 m.). Line skirts foot of Djebel Sidi Rgheiss to the Garaet et Tarf marshes.
79·1	BIR ROUGA	Alt. 3,005 ft. (916 m.). Halt. No stop signals.
92·1	AIN BEIDA	Alt. 3,258 ft. (993 m.). Watering facilities (public supply.) Engine shed. Turntable (14 m.). 1 loop line (330 m.). 1 siding (150 m.). Junction with line to Khenchela (Route 17 A).
101·8	OULMÈNE	Alt. 2,956 ft. (901 m.). Watering facilities (public supply). 1 loop line (306 m.). Line to Khenchela leaves just beyond station.
113·0	DJEZIA	Alt. 3,064 ft. (934 m.). 1 loop line (337 m.).
124·8	MAZOULA	Alt. 3,140 ft. (957 m.). 1 loop line (315 m.).
137·8	LA MESKIANA	Alt. 2,743 ft. (836 m.). Watering facilities (steam pump). 1 loop line (385 m.). 1 siding (302 m.). Line crosses Oued Meskiana, and rises gradually between Djebel Stish and Djebel Motloug.
157·4	MZOUZIA	Alt. 3,202 ft. (976 m.). 1 loop line (317 m.). Line passes Djebel Troubia on right.
177·1	YOUKS-LES-BAINS	Alt. 2,782 ft. (848 m.). Watering facilities (public supply). 1 loop line (354 m.).
195·2	TÉBESSA	Alt. 2,805 ft. (855 m.). Watering facilities (steam pump). 1 loop line (269 m.).

Branch Line. 17 A. AIN BEIDA-KHENCHELA

Length

33·5 miles, 53·8 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1·00 m.). Minimum radius of curves, 110 m. Maximum up gradient, 1 in 40 Ain Beida-Khenchela. Maximum distance between

passing loops, 23·6 km. (15 miles) Oued Nini–Auguste Comte. Minimum length of loop lines at stations, 194 m.

Speed and capacity

Overall time (including stops): 2 hrs. 30 min. Capacity of line, 4 trains per day each way.

Miscellaneous

Engine sheds at Ain Beida.

GENERAL DESCRIPTION

This line connects with the Ouled Rahmoun–Tébessa line at Oulmène. It is largely concerned with mineral traffic and is no longer open for passengers, having been superseded by road transport. The line turns south-west from the Ouled Rahmoun–Tébessa line at Oulmène, and generally follows the road, passing the marshy depression of Garaet et Tarf, except where it makes a bend to the west after leaving Tarf halt to climb to Khenchela. The country is open and sparsely populated.

DETAILED DESCRIPTION

<i>Distance in km. from Ain Beida</i>	<i>Stations</i>	<i>Remarks</i>
0·0	AIN BEIDA	Alt. 3,258 ft. (993 m.). Watering facilities (public supply). Engine shed. Turntable (14 m.). 1 loop line (330 m.). 1 siding (150 m.). Junction for line south-east to Tébessa (Route 17).
9·7	OULMÈNE	Alt. 2,956 ft. (901 m.). Watering facilities (public supply). 1 loop line (306 m.). Line to Tébessa leaves just beyond station.
17·3	OUED NINI	Alt. 2,818 ft. (859 m.). 1 loop line (194 m.).
18·7	..	Bridge over watercourse (111 m.), metal.
23·7	TARF	Alt. 2,815 ft. (858 m.). Halt. No stop signals. Line passes south-east corner of Garaet et Tarf.
26·0	..	Bridge over Oued Arssaoui (20 m.), metal.
32·9	BIR SMAINE	Alt. 2,831 ft. (863 m.). Halt. No stop signals.
40·9	AUGUSTE COMTE (BAGHAI)	Alt. 2,917 ft. (889 m.). 1 loop line (210 m.). Line rises steeply.
48·7	MENNCHAR	Alt. 3,333 ft. (1,016 m.). Halt. No stop signals. Line continues to rise steeply with gradients reaching 1 in 39.
53·8	KHENCHELA	Alt. 3,720 ft. (1,134 m.). Watering facilities (public supply). Turntable (6 m.). 1 loop line (248 m.). Situated at foot of north-eastern slopes of Aurès mountains.

18. BÔNE-ST. CHARLES

Length

61 miles, 98·2 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1·00 m.). Single track. Minimum radius of curves, 100 m. Maximum up gradient, 1 in 50 in each direction. Maximum distance between passing loops, 10·2 km. (6 miles) Bône-Karézas. Minimum length of loop lines at stations, 60 m.

Speed and capacity

Overall time: passenger trains, 4 hrs. Capacity of line, 12 trains per day each way.

Miscellaneous

Engine sheds at Bône and Jemmapes.

GENERAL DESCRIPTION

This line was originally developed by the Cie de Mokta el Hadid, which exploited the iron deposits in the neighbourhood of Ain Mokra and in the foothills of Djebel Edough between there and Bône. Formerly it used the Gare du Mokta, a station separate from that of the Bône-Duvivier railway.

The line crosses the Karézas plain between Djebel Edough on the west and Djebel bou Hamra on the east, skirting the northern edge of the Massif du Belellieta. The line continues along the northern shore of Lac Fetzara, a marshy depression covering some 35,000 acres, and reaches Ain Mokra near the mines of Mokta el Hadid. From Ain Mokra the line follows the main road closely across the marshy lowland west of Lac Fetzara, and then leaves the road, making a wide bend to the south to Gastu. Thence it turns generally west and follows the Guelma-Philippeville road. After passing Jemmapes it rises to the col on which Ras el Ma is situated and descends to the valley of the Oued Safsaf, crossing it just before reaching St. Charles, where it joins the Philippeville-Constantine line.

DETAILED DESCRIPTION

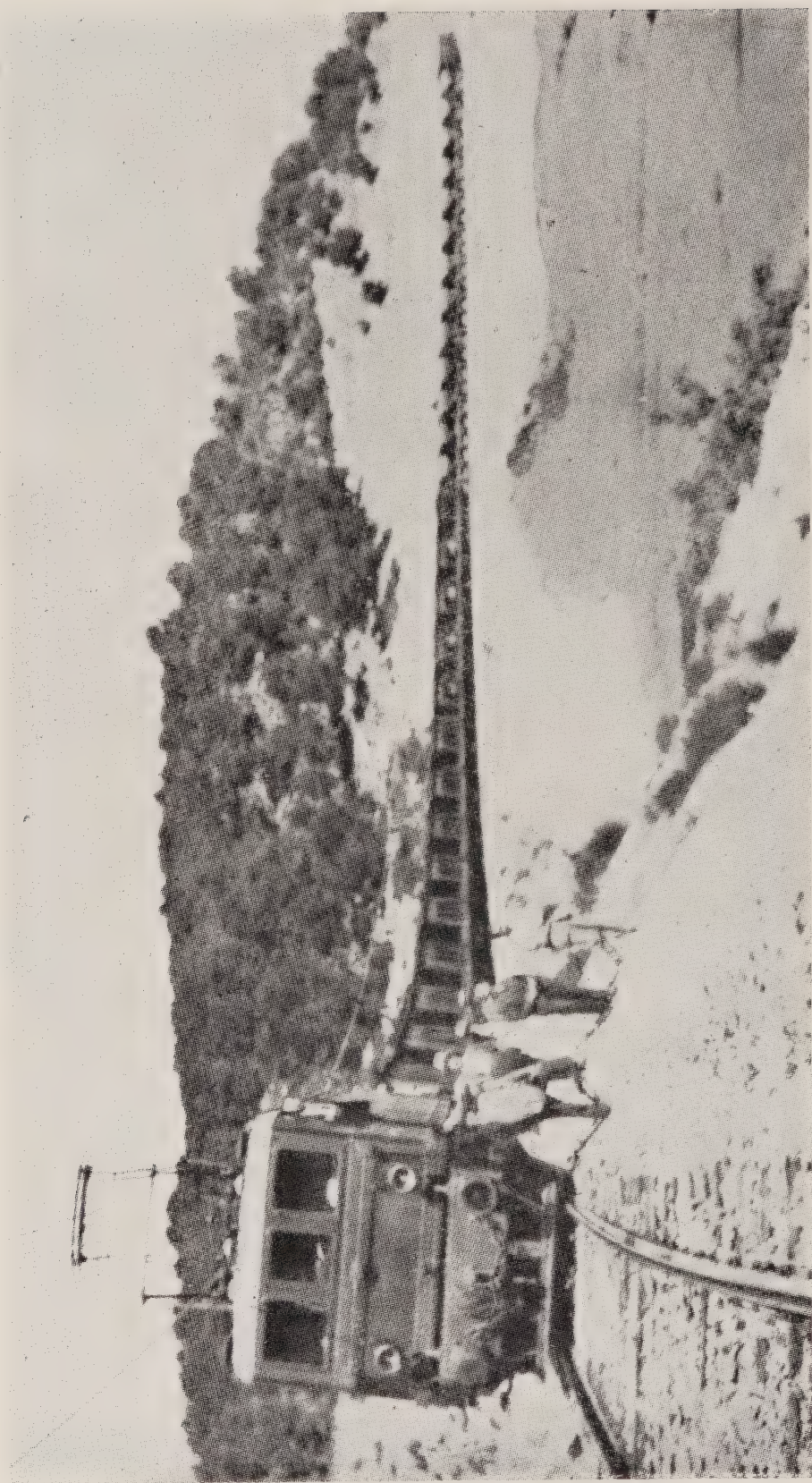
<i>Distance in km. from Bône</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BÔNE	Alt. 6 ft. (2 m.). Watering facilities (town supply). Turntable. Narrow-gauge lines serve the Quai Ouest, the Quai Warnier, and the Quai Nord. Terminus for narrow-gauge line east to la Calle (Route 20) and normal-gauge line south to Duvivier (Route 19).
0.5	..	Bridge over Oued Budjema (bou Djema) (34 m.), metal.
10.2	KARÉZAS	Alt. 39 ft. (12 m.). 1 loop line (360 m.).
12.9	FERME DE LACOMBE	Alt. 59 ft. (18 m.). Halt.
17.9	OUED ZIED	Alt. 62 ft. (19 m.). Watering facilities. 2 loop lines (323 m. and 117 m.).
25.6	AIN DALIA	Alt. 49 ft. (15 m.). 2 loop lines (165 m. and 443 m.).
32.3	AIN MOKRA	Alt. 79 ft. (24 m.). Watering facilities. 2 loop lines (241 m. and 83 m.).
38.1	GERST-TOBEIGA	Alt. 88 ft. (27 m.). 1 loop line (72 m.).
43.5	BOU MAIZA	Alt. 72 ft. (22 m.). 1 loop line (60 m.).
49.7	HADJAR SOUD	Alt. 98 ft. (30 m.). 2 loop lines (107 m. and 101 m.).
52.7	FERME MAKASSA	Alt. 124 ft. (38 m.). Halt.
54.9	..	Bridge over Oued Hammam (30 m.), metal.
56.6	GASTU	Alt. 190 ft. (58 m.). Watering facilities. 2 loop lines (95 m. and 121 m.). Station 1.5 km. north of village.
58.0	..	Bridge over Oued Zeer (10 m.), metal.
61.1	FERME VIEVILLE	Alt. 148 ft. (45 m.). Halt.
63.7	AURIBEAU	Alt. 177 ft. (54 m.). 2 loop lines (67 m. and 157 m.). Numerous small streams crossed.
67.3	OUED HAMIMINE	Alt. 285 ft. (87 m.). 1 loop line (70 m.).
69.7	FOY	Alt. 230 ft. (70 m.). 1 loop line (75 m.).
70.3	..	Bridge over Oued el Amfèche (10 m.), stone.
74.0	JEMMAPES	Alt. 285 ft. (87 m.). Watering facilities. Engine shed. 1 loop line (95 m.).
77.6	BAYARD	Alt. 344 ft. (105 m.). 1 loop line (167 m.).
78.4	..	Bridge over Oued el Fendek (30 m.), metal.
82.2	TANGOUT	Alt. 436 ft. (133 m.). Halt.
84.8	RAS EL MA	Alt. 555 ft. (169 m.). 1 loop line (64 m.).
89.3	..	Bridge over Oued Deb (15 m.), stone.
91.0	OUED DEB	Alt. 269 ft. (82 m.). Halt. 1 loop line (98 m.).
94.5	RIVIÈRE	Alt. 226 ft. (69 m.). 1 loop line (87 m.).
97.7	..	Bridge over Oued Safsaf (40 m.), metal.
98.2	ST. CHARLES	Alt. 128 ft. (39 m.). Watering facilities. 1 loop line (79 m.). Junction with Philippeville-Constantine normal-gauge line (Route 15).



120. *Biskra-Touggourt line near Mraier (Route 16)*



121. *Rail car on line near Biskra (Route 16)*



122. Mineral train on electrified line between Bône and Oued Kébérît (Routes 12, 19, 21)

19. BÔNE-DUVIVIER

(Photo. 122)

Length

34 miles, 54.7 kilometres.

Branch line

The line to Randon leaves at St. Paul, mile 9 (km. 15).

Traction

Electric and steam.

Power generated at Bône steam power station. Station equipped with four groups of generators of 10,500 kVA. Line worked on 3,000 volts D.C. Sub-station at Bône equipped with mercury-arc rectifiers. Automatically controlled.

For details of overhead equipment, *see* p. 347.*Permanent way*

Gauge: normal (1.435 m.). Single track. Maximum axle load, 20 tons. Minimum radius of curves, 200 m. Maximum up gradient, 1 in 40 in each direction. Maximum distance between passing loops, 13.9 km. (8 miles) St. Joseph-Duvivier. Minimum length of loop lines at stations, 266 m.

Capacity

Capacity of line, 16 trains per day each way.

Miscellaneous

Carriage and wagon works at Bône. Engine sheds at Bône and Duvivier.

GENERAL DESCRIPTION

Bône is the chief outlet for the mineral traffic of the Tébessa and Oued Kébérît districts, for which the electrification of the line from Oued Kébérît to Bône was undertaken (Photo. 122). This line carries much heavy traffic and may now be double-tracked, but no further information is available for publication. From Bône the line crosses the low-lying fertile plain of the Oued Seybouse, at some distance from the river until it reaches Barral. Here the valley narrows and wooded highland rises on both sides. The railway and road both follow the lower slopes of the highland on the left bank of the river as far as Duvivier. The villages are mostly on the lower slopes of the highland away from the river. The line rises very gradually from the coast and is only 312 feet (95 m.) above sea-level at Duvivier.

DETAILED DESCRIPTION

<i>Distance in km. from Bône</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BÔNE	Alt. 6 ft. (2 m.). Watering facilities (town supply). Turntable. 1 loop line (278 m.). Assisting engine in steam. Reserve engine out of steam. Electric sub-station. Carriage and wagon works for normal gauge. Several loop and dead-end sidings; spur to phosphates installation (loop and dead-end sidings on spur). Terminus for narrow-gauge lines west to St. Charles (Route 18) and east to la Calle (Route 20). Line leaves Bône and ascends Oued Seybouse valley.
0.6	..	Bridge over Oued Budjema (bou Djema) (34 m.), metal.
1.8	HIPPONE	Alt. 10 ft. (3 m.). Halt. 1 loop line.
5.3	ALLÉLICK	Alt. 20 ft. (6 m.). Halt.
8.0	..	Bridge over canal (10 m.), metal.
10.3	DUZERVILLE	Alt. 30 ft. (9 m.). 1 loop line (457 m.). 1 loop siding.
15.4	ST. PAUL	Alt. 40 ft. (12 m.). 1 loop line (437 m.). 1 loop siding. Junction with line to Randon. Vine-growing district.

Branch Line to Randon

0	ST. PAUL	..
6	DAROUSSA	Line runs alongside road all the way. Distances from St. Paul.
8	ARD KAHLA	..
12	RANDON	Vine-growing centre.
18.6	OUED SBA	Alt. 52 ft. (16 m.). 1 dead-end siding.
19.1	..	Bridge over Oued Sba (10 m.), stone.
23.3	MONDOVI	Alt. 79 ft. (24 m.). 1 loop line (421 m.). 1 loop siding.
24.2	..	Bridge over Oued Budjema (bou Djema) (8 m.), metal.
29.2	BARRAL	Alt. 101 ft. (31 m.). Watering facilities (town supply). 1 loop line (454 m.). 1 loop siding.
38.2	..	Bridge over Oued Abdallah, arches 3 × 6 m., stone.
40.9	ST. JOSEPH	Alt. 125 ft. (38 m.). 1 loop line (415 m.). 1 loop siding.
		Fruit-growing centre.
46.1	..	Bridge over Oued Frarah (12 m.), metal.
47.4	OUED FRARAH	Alt. 246 ft. (75 m.). Halt.
50.8	BOU DAROUA	Alt. 264 ft. (80 m.). Halt.
		Centre of tobacco cultivation.
54.7	DUVIVIER	Alt. 312 ft. (95 m.). Junction with Algiers to Ghardimaou main line (Route 12). For details, see p. 393.

20. BÔNE-LA CALLE

Length

55 miles, 88 kilometres.

Traction

Steam.

Permanent way

Gauge: narrow (1.00 m.). Single track. Maximum distance between stations, 22 km. (14 miles), Morris-Lac des Oiseaux.

Speed and capacity

Overall time (including stops): passenger trains, 3 hrs. 20 min.

GENERAL DESCRIPTION

This narrow-gauge line passes through the extensive Guerrah el Mekada marshes near the mouth of the Oued el Kebir, then crosses wooded (cork oak) and lake-studded hills between the Monts de la Medjerda and the sea to reach la Calle, a small and unimportant port. The line crosses low-lying country for most of its length, hardly rising above 165 ft. (50 m.) except for two short stretches between Blandan and le Tarf, and between Lac Tonga and la Calle. It follows the western shore of Lac Tonga along the lower slopes of the Forêt de la Calle. It is only on the last short stretch of the line that there are any steep gradients. The country is scantily populated, especially between Bône and Blandan.

DETAILED DESCRIPTION

<i>Distance in km. from Bône</i>	<i>Stations</i>	<i>Remarks</i>
0.0	BÔNE	Alt. 6 ft. (2 m.). Watering facilities (town supply). Turntable. Terminus for narrow-gauge line west to St. Charles (Route 18), and normal-gauge line south to Duvivier (Route 19).
1.5	..	Bridge over Oued Seybouse.
6.5	BOUKAMIRA	Halt.
10.5	LES DUNES	Halt.
12.0	LA PLAINE	Halt.
14.0	EL KOUS	Halt.
20.0	MORRIS	Alt. 26 ft. (8 m.).
21.5	..	Bridge over Oued bou Namoussa.

<i>Distance in km. from Bône</i>	<i>Stations</i>	<i>Remarks</i>
26.0	LE MARAIS	Halt. Line crosses Guerrah el Mekada marshes.
38.5	LAC DES OISEAUX	Halt. Line runs between wooded hills (Djebel Hammoum) to south and small Lac des Oiseaux to north.
42.0	..	Bridge over Oued Boulatane, tributary of Oued el Kebir.
42.5	OUED BOULATANE	Alt. 49 ft. (15 m.). Halt.
46.5	BLANDAN	Line enters narrow valley of Oued el Kebir between wooded hills.
54.5	..	Line crosses road N. 12.
57.0	LE TARF	Line crosses tributary of Oued el Kebir.
62.0	..	Bridge over Oued el Kebir.
64.0	YUSUF	Line gradually descends to eastern shores of Lac Oubeira.
69.5	LAC OUBEIRA	Lake on west side of line. Line crosses road N. 12 immediately on leaving station, and then crosses marshy lowland and wooded hills.
73.5	..	Line reaches Lac Tonga depression.
74.5	..	Halt. After following western shore for 3 km. (2 miles) line leaves lake and turns westward across highland with many bends and steep gradients.
83	LA CALLE	Alt. 82 ft. (25 m.).

21. SOUK AHRAS-TÉBESSA-HAIDRA (TUNISIA)

(Photo. 122)

Length

Souk Ahras-Oued Kébérit	35 miles	56.2 kilometres
Oued Kébérit-Tébessa	42 „	68.3 „
Tébessa-Haidra	27 „	43 „
	<u>104</u>	<u>167.5</u>

Branch line

The line to Djebel Ouenza leaves at Oued Kébérit, mile 35 (km. 56.2).

Traction

Electric and steam: electric from Souk Ahras to Oued Kébérit; steam from Oued Kébérit to Tébessa and on the branch line from Oued Kébérit to Djebel Ouenza.

Electrification

For details see pp. 346–347.

Permanent way

Gauge: normal (1.435 m.), Souk Ahras–Oued Kébérit and branch to Djebel Ouenza; narrow (1.00 m.), Oued Kébérit–Tunisian frontier. Single track. Maximum axle load, 20 tons (Souk Ahras–Oued Kébérit section). Minimum radius of curves, 200 m. Maximum up gradient, 1 in 40 in each direction. Maximum distance between passing loops, 16.4 km. (10 miles) Morsott–Boulaf-le-Dir. Minimum length of loop lines at stations, 250 m.

Capacity

Capacity of line, Souk Ahras–Oued Kébérit, 16 trains per day each way; Oued Kébérit–Tébessa, 8 trains per day each way.

Miscellaneous

Locomotive shops and permanent-way building at Souk Ahras. Engine sheds at Souk Ahras, Oued Kébérit, and Tébessa.

GENERAL DESCRIPTION

This line was in origin strategic rather than commercial; it was built on the 1.00-m. gauge, and was not designed to take heavy loads. With the exploitation of the phosphate and iron-ore deposits of eastern Algeria the gauge proved to be uneconomical, and the line was converted to normal gauge and subsequently electrified as far as Oued Kébérit (Photo. 122).

From Souk Ahras the line ascends the valley of the Oued Medjerda through well-wooded highland (pine, holm oak, and juniper), and emerges on to an open, monotonous, and sparsely populated plateau. It then descends again to the valley of the Oued Mellègue and to Oued Kébérit. The short branch line to the mines of Djebel Ouenza is of the ordinary normal gauge, but is not electrified. At Oued Kébérit the line becomes narrow gauge (1.00 m.) and crosses an undulating plateau following the valleys of the Oued Mellègue and its upper course, the Oued Chabron. It serves the phosphate mines near Tébessa (p. 247), and there are several mineral branch lines. The line turns eastward at Tébessa to the Tunisian frontier.

DETAILED DESCRIPTION

<i>Distance in km. from Souk Ahras</i>	<i>Stations</i>	<i>Remarks</i>
0.0	SOUK AHRAS	Alt. 2,208 ft. (673 m.). Watering facilities (electric pump). Turntable (23 m.). Engine shed (round-house). Locomotive shops. Electric sub-station. Permanent-way building. Passing loop (420 m.). 7 loop sidings. Dead-end sidings. Assisting engine in steam. Reserve engine out of steam. Junction with Constantine-Ghardimaou main line (Route 12). Line descends into valley of Oued Medjerda with gradient of 1 in 40.
0.9	..	Tunnel (550 m.).
1.9	..	Tunnel (644 m.).
2.8	..	Tunnel (296 m.).
3.4	..	Tunnel (212 m.).
3.8	..	Bridge, arches 2×10 m., stone.
4.4	..	Tunnel (138 m.).
5.4	..	Viaduct, arches 7×10 m., stone, followed by metal bridge over Oued Medjerda (85 m.).
6.5	LES TUILERIES	Alt. 1,791 ft. (546 m.). Watering facilities (well). 1 loop line (450 m.). 4 loop sidings. Bridge over the Oued Mengoub (35 m.), metal.
6.9	..	Tunnel (107 m.).
7.8	..	Tunnel (128 m.).
8.5	..	Tunnel (190 m.).
9.8	..	Bridge over the Oued Mengoub, arches 3×10 m., stone.
10.8	OUED CHOUK	Alt. 1,975 ft. (602 m.). 1 loop line (385 m.). 3 loop sidings. Line enters narrow valley of Oued Chouk, and ascends with gradient of 1 in 50 to Montesquieu. 3 stone bridges (2×6 m., 2×10 m., 20 m.) at km. 11.1, 12.6, 14.6.
17.9	EL HAMRI	Alt. 2,313 ft. (705 m.). 1 loop line (335 m.). 1 loop siding. 2 stone bridges (20 m. each) at km. 18.8, 20.6.
23.6	DRÉA	Alt. 2,631 ft. (802 m.). 1 loop line (365 m.). 3 loop sidings.
27.7	..	Bridge, arches 3×6 m., stone.
32.1	MONTESQUIEU (MDAOUROUCH)	Alt. 2,815 ft. (858 m.). Watering facilities. 1 loop line (382 m.). 3 loop sidings. 3 dead-end sidings. Line descends with gradient of 1 in 67 to valley of Oued Mellègue.
42.8	..	Bridge, arches 3×7 m., stone.
43.6	OUED DAMOUS	Alt. 2,320 ft. (707 m.). Halt. Watering facilities (well). 1 loop line (405 m.). 1 loop siding. Electric sub-station.

<i>Distance in km. from Souk Ahras</i>	<i>Stations</i>	<i>Remarks</i>
		2 stone bridges (2×7 m. and 3×7 m.) at km. 49·3, 53·3.
54·2	..	Viaduct, arches 3×13 m., stone.
56·2	Oued KÉBÉRIT	Alt. 2,037 ft. (621 m.). Line changes from normal to narrow (1·00 m.) gauge, and from electric to steam traction. Watering facilities (well). Turntable (normal gauge). 2 loop lines (413 m. and 377 m.). 4 loop sidings (normal gauge). Assisting engine in steam. Several loop and dead-end sidings (1·00-m. gauge). Junction for normal-gauge line east to Djebel Ouenza iron-ore mines (with branch to Djebel bou Kadra mines).

Branch Line to Djebel Ouenza

0	Oued KÉBÉRIT	..
2	..	Bridge over Oued Mellègue. Distances from Oued Kéberit.
10	AIN CHENIA	Junction for short branch (11 miles, 17 km.) south to Djebel bou Kadra iron mines (p. 241).
25	DJEBEL OUENZA	Important iron mines (p. 241).
58·6	..	Deck bridge over Oued Mellègue (62 m.), metal. 2 short bridges at km. 60·1, 63·2.
64·2	CLAIREFONTAINE	Alt. 2,146 ft. (654 m.). Watering facilities (steam pump). 1 loop line (302 m.). 4 loop sidings.
78·0	SIDI YAHIA	Alt. 2,270 ft. (692 m.). 1 loop line (450 m.). 1 loop siding. 3 short bridges at km. 81·5, 86·8, 91·5.
92·2	MORSOTT	Alt. 2,493 ft. (760 m.). Watering facilities (well). 1 loop line (340 m.). 1 loop siding.
108·7	BOULAF-LE-DIR	6 short bridges between km. 94 and 106. Alt. 2,490 ft. (749 m.). 1 loop line (250 m.). 2 mineral lines branch off to left to phosphate mines.
124·5	TÉBESSA	5 short bridges between km. 117·0 and 123·6. Alt. 2,805 ft. (855 m.). Watering facilities. Engine shed (2 tracks). Turntable. 1 loop line (277 m.). 4 loop sidings. Assisting engine in steam.
125·8	SIDI FERADJ	Junction with narrow-gauge line north-west to Ouled Rahmoun (Route 17). Halt.
140·9	..	4 short bridges between km. 129·0 and km. 132·0.
148·0	..	Bridge.
148·2	..	Algerian customs post.
		Junction with short branch (2 km.) north to phosphate mines of Djebel Kouif (p. 247).

<i>Distance in km. from Souk Ahras</i>	<i>Stations</i>	<i>Remarks</i>
148.5	RHILANE	Alt. 3,593 ft. (1,095 m.).
151.0	..	Tunnel (c. 1,000 m.).
158.0	..	Bridge over Oued Soumaa.
158.5	..	Frontier between Algeria and Tunisia.
159.5	AIN KERMA (TUNISIA)	Halt.
162.0	..	Bridge over Oued Haidra.
167.0	HAIDRA (TUNISIA)	Alt. 2,952 ft. (900 m.).

CHAPTER XVII

OTHER COMMUNICATIONS

WATERWAYS

RIVERS are generally classed as 'permanent' in Algeria if small streams of water, or at least pools, persist in their channels throughout the summer: such rivers are, however, few in number, the majority being very low and even dry during the prolonged drought of summer. Only the Oued Seybouse can be regarded as navigable in any sense. Small coasters can make use of the combined mouth of this river and the Oued Budjema (bou Djema), but in practice only the smallest vessels do so, probably because the depths (from 3 to 5 ft.) are liable to considerable alterations after each rainy season and because of the presence of shoals. No other river or even estuary is navigable, a fact which explains in large part the delay in the economic development of the country until railways and, later, motor roads had been constructed.

SEA ROUTES

As the extension of metropolitan France across the Mediterranean, Algeria is provided with exceptionally good shipping services. Marseilles is the principal French passenger port for Algeria: from it, more than half a million persons went to French North Africa in 1938, 350,000 to Algeria (mainly Algiers). The packet station of Port Vendres, less than 10 miles from the Spanish frontier, offers a shorter and smoother sea crossing than from Marseilles, and before the war it was becoming an increasingly active mail and passenger port, with about 100,000 travellers passing through each year, rather more than half going to Algiers and the rest to Oran.

The main sea routes operating before the outbreak of war were as follows:

Algiers—Marseilles

402 sea miles (463 miles). 20–36 hours.

Companies: Cie générale Transatlantique (four times weekly).

Cie de Navigation mixte (twice weekly, one calling at Palma, Majorca).

Société générale de Transports maritimes (twice weekly, one calling at Barcelona).

Algiers-Port Vendres

356 sea miles (410 miles). 20 hours.

Company: C^{ie} de Navigation mixte (twice weekly).

Algiers-Southampton

1,519 sea miles (1,797 miles). 4 days.

Company: Nederland Royal Mail line (about every three weeks).

Algiers-Genoa

557 sea miles (640 miles). 38 hours.

Company: Nederland Royal Mail line (about every three weeks).

Algiers-Tunis

405 sea miles (466 miles).

Company: Société Algérienne de Navigation (irregular, mainly cargo service).

Oran-Marseilles

525 sea miles (604 miles). 32-36 hours.

Companies: C^{ie} générale Transatlantique (weekly).

Société générale de Transports maritimes (twice weekly).

Oran-Port Vendres

459 sea miles (528 miles). 23 hours.

Company: C^{ie} de Navigation mixte (twice weekly).

Oran-Casablanca

424 sea miles (488 miles).

Companies: C^{ie} de Navigation paquet (twice monthly, via Tangier).

C^{ie} Orano-Marocaine (Mazzella et C^{ie}) (twice monthly, via Tangier).

Oran-Gibraltar

234 sea miles (269 miles).

Company: Bland Line (weekly, connecting with the company's weekly Gibraltar-Tangier-Casablanca service).

• *Bougie-Marseilles*

395 sea miles (455 miles). 60 hours.

Company: Société générale de Transports maritimes (weekly, calling at Philippeville on outward journey and at Bône on return).

Philippeville-Marseilles

395 sea miles (455 miles). 20-35 hours.

Companies: Cie générale Transatlantique (weekly, continuing to Bône).

Cie de Navigation mixte (weekly, sometimes calling at Bône).

Société générale de Transports maritimes (weekly, either direct or calling at Bône).

Bône-Marseilles

402 sea miles (463 miles). 33-37 hours.

Companies: Cie générale Transatlantique (weekly, from Philippeville).

Cie de Navigation mixte (weekly, from Philippeville).

Société générale de Transports maritimes (weekly, either direct or calling at Philippeville).

AIR

The following notes deal exclusively with the position at the outbreak of the present war, and all reference to developments since the landing of Allied forces is omitted. General information on the suitability of terrain for airfields and on climate can be obtained from Vol. I, Chaps. II and IV: neither detailed appreciation nor deductions concerning air operations are included owing to conditions imposed by the war.

In 1939 the main airfields in Algeria were at Maison Blanche (11 miles east-south-east of Algiers) and la Sénia (5½ miles south-south-east of Oran). Other airfields were at Blida, Constantine (Oued Hamimim or le Khroub), Sétif (Ain Arnat), and Colomb Béchar. There was also a network of landing-grounds throughout southern Algeria and the adjoining parts of the Sahara (pp. 424-425). An airfield was being built at Tafaraoui, 12½ miles south-east of Oran.

There were seaplane airports at Oran (Bassin Gueydon), Algiers (Agha), and Bône. The building of a permanent seaplane station at Arzeu began in 1939, but had not been completed when the port was occupied by Anglo-American forces in 1942. There were emergency seaplane alighting bases, where aircraft could descend if necessary, at Arzeu, Ténès, Dellys, Bougie, Djidjelli, Herbillon (Mersa Tukush), and Collo.

The companies operating services before the war were Air France (the national company of France formed in 1933 by the merger of the four chief air-transport concerns), Régie Air Afrique (another French company), and the Belgian Sabena (Société anonyme Belge d'Exploitation de la Navigation aérienne).

Air France operated the daily flying-boat service from the Mari-gnane airport near Marseilles to Algiers (Agha) and the daily service from Toulouse to Oran, and on to Fes, Casablanca, Dakar, and Santiago da Chile. In 1938, 316,000 miles were flown on commercial service on the Marseilles-Algiers line and 4,520 passengers, 83 tons of freight (excluding baggage), and 65.6 tons of mail were carried. On the Toulouse-Oran-Casablanca service 874,000 miles on commercial service were flown, and 9,164 passengers, 245.7 tons of freight (excluding baggage), and 160.8 tons of mail were carried.

Régie Air Afrique opened a service in 1935 on the Algiers-Belgian Congo (Leopoldville) route, which was soon extended to Broken Hill (Northern Rhodesia) to connect with the Madagascar services also started in 1935. In 1936 it took over the Tunis-Algiers-Oran route which connected at Oran with the Air France Toulouse-South America service: there was a daily service from Tunis to Algiers (Agha), with stops at Constantine and Bône, and a three times weekly service from Algiers to Oran (la Sénia). The company also operated the bi-weekly service from Algiers to Antananarivo (Madagascar).

Sabena operated services from Brussels to the Belgian Congo (Leopoldville) and Madagascar (Antananarivo) in a pool with Régie Air Afrique.

Before the war the authority responsible for civil aviation in Algeria was the Service central de l'Aéronautique civile.

The figures for traffic arising from air transport services at the air-fields at Algiers and Oran in 1938 were as follows:

<i>Airfield</i>	<i>Plane arrivals and departures</i>	<i>Passengers arriving and departing</i>		<i>Mail (tons)</i>		<i>Freight¹ and excess baggage (tons)</i>	
		<i>Fare-paying</i>	<i>Free</i>	<i>Departing</i>	<i>Arriving</i>	<i>Departing</i>	<i>Arriving</i>
Algiers	1,602	6,917	600	22.9	21.5	21.7	20.4
Oran	1,849	2,846	165	4.7	6.4	32.7	5.7

¹ Excluding baggage carried free.

Throughout southern Algeria and the Sahara in general there were large numbers of landing-grounds. These are not listed in this hand-book owing to conditions imposed by the war. The three routes in 1939, and the main landing-grounds, were as follows (cf. Fig. 74):

The Tanezrouft line: Ain Sefra (south of Oran), Colomb Béchar (airfield), Beni Abbès, Reggan, Bidon Cinq, Gao (French Soudan) (airfield).

The Ahaggar (Hoggar) line: Laghouat (south of Algiers), Ghardaia, el Goléa, In Salah, Arak, Tamanrasset, In Guezzam, Agades (French Niger).

The Ajjers and Tibesti line: Biskra (south of Constantine), Touggourt, Ouargla, Fort Flatters, Fort Polignac, Fort Charlet (Djanet), Bilma (French Niger), Fort Lamy (French Equatorial Africa) (airfield).

Regular air services (those to the Belgian Congo and Madagascar) used the Tanezrouft and Ahaggar routes before the war, particularly the former, but the Ajjers and Tibesti line was used only occasionally by Régie Air Afrique services. For the continuation of these routes into French West Africa reference should be made to the appropriate handbook (B.R. 512).

SIGNAL COMMUNICATIONS

The following notes summarize the position in 1939-1940: reference to developments since that date are omitted.

Telegraph and Telephone

The main telegraph and telephone lines run parallel to the coast with branches to the various towns and ports on the coast. The lines are generally laid along the main roads and railways. Inland there were in 1939 only two long branches from the main line, one in western Algeria to Colomb Béchar and Beni Abbès, the other in central Algeria to Ghardaia and el Goléa. The latter line formerly continued to In Salah, which is now served by a wireless station. These branches were linked by a line from Ain Sefra to Laghouat. All the lines were overhead, except that from Oran through Blida, Algiers, Ménerville, and Constantine to Philippeville, which is buried. The principal lines are shown on the map in the pocket at the end of the book.

All exchanges required an operator, apart from the following automatic exchanges, supplied by the C^{ie} générale des Constructions téléphoniques:

Algiers (Facultés)	.	.	.	9,000 lines
„ (Mustapha)	.	.	.	4,000 „
„ (Hussein Dey)	.	.	.	700 „
„ (el Biar)	.	.	.	500 „
Oran	.	.	.	6,000 „
Sidi bel Abbès	.	.	.	1,000 „
Blida	.	.	.	900 „
Sétif	.	.	.	800 „
Constantine	.	.	.	No information
Mascara	.	.	.	No information

There are normally telephones in addition to telegraph lines between, as well as in, the towns. In 1936 there were 32,079 telephones.

Submarine Cables

The following submarine cables (all single wire) were operated in 1939:

Nemours–Chafarine Islands.

Oran–Marseilles (two).

Algiers (Hussein Dey)–Marseilles (three).

Philippeville (Stora)–Marseilles.

Bône–Marseilles (two).

Bône–Malta (three).

In 1939 allocations were made by the French Government for the laying of further cables from Oran to Marseilles. All the above were owned by the French Government, except the cable from Nemours to the Chafarine Islands, owned by the Spanish Government, and those from Bône to Marseilles and Malta, which belonged to Cable and Wireless Ltd. Submarine cables are shown on the map in the pocket at the end of the book.

Wireless Stations

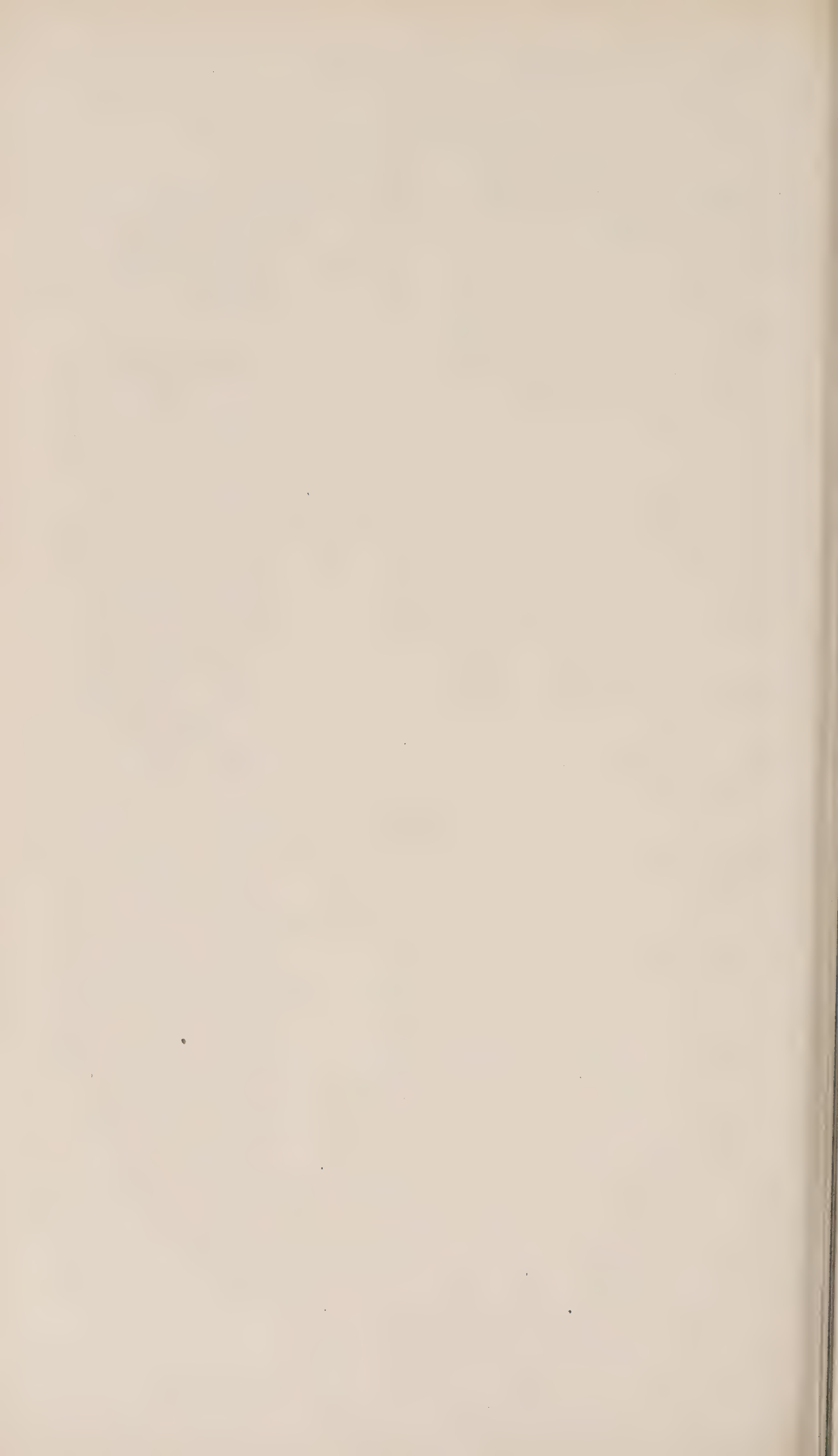
The lack of telegraphic communications inland is partly compensated by wireless from the military stations, and in certain cases (e.g. In Salah) stations which formerly had telegraph lines are now served instead by wireless. The table below gives available detail of the main wireless stations of Algeria in 1939–1940, the various groups being controlled or sub-controlled by the stations mentioned in the final column.

<i>Name of station</i>	<i>Approximate position</i>	<i>Wave-length: long, medium, or short</i>	<i>Power (in kW.) or range (if known)</i>	<i>Remarks</i>
Adrar	27° 53' N. 0° 20' W.	3 medium 2 short	..	Military station of sub-group controlled by Ouargla.
Aiguille, Cap de l' (Abuja Point)	35° 53' N. 0° 29' W.	1 medium	Range 100 miles	Radiobeacon and fog signal station.
Ain Sefra	32° 45' N. 0° 35' W.	3 medium 2 short	..	Military station of main group controlled by Algiers.

<i>Name of station</i>	<i>Approximate position</i>	<i>Wave-length: long, medium, or short</i>	<i>Power (in kW.) or range (if known)</i>	<i>Remarks</i>
Algiers	36° 50' N. 3° 00' E.	3 medium 2 short	..	Main control station. Also for work with Paris and stations as required in French Morocco and French West Africa.
Algiers	36° 45' N. 3° 11' E.	4 medium	1-5 kW. for each frequency	Coast station. Navigational warnings (gunnery practice). Meteorological bulletins.
Algiers	..	2 short	..	Air station, working with France-French West Africa-Brazil air services and with Paris, Marseilles, Toulouse, Alicante, Barcelona, and Malaga. Exact position not available.
Algiers (<i>Aéradio</i>)	36° 45' N. 3° 04' E.	3 short	0.5	Civil aeronautical station keeping watch for aircraft (service by request to Régie Air Afrique), and for long-distance communications.
Algiers (<i>Aéradio</i>)	36° 42' N. 3° 14' E.	4 medium	0.5	Civil aeronautical station. Direction finding. Communication relating to landing manœuvres. Radio-telephony.
Algiers (<i>Aérogonio</i>)	36° 42' N. 3° 14' E.	2 medium	0.5	Aeronautical direction-finding station. Radio-telephony.
Algiers (<i>Amirauté</i>)	36° 47' N. 3° 04' E.	1 medium 1 short	..	Naval station working with French warships.
Algiers (<i>Eucalyptus</i>)	36° 40' N. 3° 08' E.	2 short	10	Government and commercial station. Service to France (including radio-telephony) and Jibuti (French Somaliland). The receiving station for Algiers (<i>Eucalyptus</i>) is at Boufarik.
Algiers (<i>Phare</i>)	36° 47' N. 3° 04' E.	1 medium	Range 50 miles	Radiobeacon and fog signal station.
Algiers (<i>Radio</i>)	36° 40' N. 3° 08' E.	1 medium	15	Station under administration of Postes, Téléphones, et Télégraphes. Broadcasts on medium and short wave-lengths.
Amguid	26° 26' N. 5° 20' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar.

<i>Name of station</i>	<i>Approximate position</i>	<i>Wave-length: long, medium, or short</i>	<i>Power (in kW.) or range (if known)</i>	<i>Remarks</i>
Aoulef	26° 58' N. 1° 05' E.	1 medium 3 short	0.5	Military air and civil aeronautical station. Public correspondence. Hours of service with Régie Air Afrique giving 48 hours' notice.
Beni Abbès	30° 11' N. 2° 15' W.	3 medium 2 short	..	Military station of subgroup controlled by Ouargla.
Blida	36° 30' N. 2° 49' E.	3 medium 2 short	..	Military air station.
Bou Bernous	27° 27' N. 2° 47' W.	3 medium 2 short	..	Military station of subgroup controlled by Ouargla.
Caxine, Cap (Phare)	36° 49' N. 2° 57' E.	1 medium	Range 200 miles	Radiobeacon and fog signal station.
Colomb Béchar	31° 36' N. 2° 15' W.	3 medium 2 short	..	Military air station.
Colomb Béchar (East)	..	3 medium 2 short	..	Military station. Sub-control station. Exact position not available.
Colomb Béchar (West)	..	3 medium 2 short	..	Military station. Sub-control station. Exact position not available.
Constantine (Aérogonio)	36° 18' N. 6° 41' E.	2 medium	0.1	Aeronautical direction-finding station. Radiotelephony. The position may have been changed.
El Goléa	30° 35' N. 2° 52' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar. Exact position not available.
Fort Charlet (Djanet)	24° 41' N. 9° 25' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar.
Fort Flatters	28° 04' N. 6° 38' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar.
Fort Polignac	26° 29' N. 8° 18' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar.
Hussein Dey	36° 49' N. 3° 07' E.	..	..	Military station, maintaining a listening watch for Algiers only.
In Salah	27° 11' N. 2° 28' E.	3 medium 2 short	..	Military station of subgroup controlled by Colomb Béchar.
Laghouat	33° 45' N. 2° 52' E.	3 medium 2 short	..	Military station of main group controlled by Algiers. Exact position not available.

<i>Name of station</i>	<i>Approximate position</i>	<i>Wave-length: long, medium, or short</i>	<i>Power (in kW.) or range (if known)</i>	<i>Remarks</i>
Oran	35° 45' N. 0° 39' W.	3 medium 2 short	..	Military station of main group controlled by Algiers, assuming control when Algiers not available.
Oran	35° 45' N. 0° 39' W.	3 medium 3 short	..	Military air station.
Oran (<i>Aéradio</i>)	35° 38' N. 0° 36' W.	4 medium	0.5	Civil aeronautical station. Radio-telephony, communications relating to landing manœuvres, direction finding, and listening.
Oran (<i>Aérogonio</i>)	35° 38' N. 0° 36' W.	2 short	0.5	Aeronautical direction-finding station.
Oran (<i>Ain et Turk</i>)	35° 45' N. 0° 45' W.	2 medium	..	Coast station.
Ouallen	24° 40' N. 1° 15' E.	3 medium 2 short	..	Military station of sub-group controlled by Colomb Béchar.
Ouargla	32° 03' N. 5° 20' E.	3 medium 2 short	..	Military station, sub-control station.
Reggan	26° 43' N. 0° 09' E.	3 medium 2 short	..	Military station of sub-group controlled by Ouargla. Exact position not available.
Tabelbala	29° 21' N. 3° 18' W.	3 medium 2 short	..	Military station of sub-group controlled by Ouargla.
Tamanrasset (Fort Lapperine)	22° 50' N. 5° 30' E.	3 medium 2 short	..	Military station of sub-group controlled by Colomb Béchar.
Timimoun	29° 10' N. 0° 15' E.	3 medium 2 short	..	Military station of sub-group controlled by Ouargla.
Tin Zaouaten	20° 00' N. 2° 55' E.	3 medium 2 short	..	Military station of sub-group controlled by Colomb Béchar. Exact position not available.
Touggourt	33° 09' N. 6° 02' E.	3 medium 2 short	..	Military station of sub-group controlled by Colomb Béchar.



APPENDIXES

- A. AGRICULTURAL STATISTICS
- B. OIL INSTALLATIONS IN ALGERIA
- C. COMMERCIAL STATISTICS
- D. NOTE ON THE TRANS-SAHARAN RAILWAY
- E. NOTE ON LITERATURE, MAPS AND CHARTS, AND
AUTHORSHIP
- F. CONVERSION TABLES

APPENDIX A

AGRICULTURAL STATISTICS

Table	I.	Area and Production of Cereal Crops, 1929-1938.
„	II.	Production of Main Cereal Crops by Arrondissements, 1937.
„	III.	Area and Production of some Non-Cereal and Fruit Crops, 1929-1938.
„	IV.	Production of Dried Vegetables by Arrondissements, 1937.
„	V.	Production of Fruits and Fruit Products by Arrondissements, 1937.
„	VI.	Number of Livestock, 1928-1937.
„	VII.	Distribution of Livestock by Arrondissements, 1937.

Note. Figures in these tables are usually given to the nearest thousand: more precise figures will sometimes be found in the text of Chapter XII.

TABLE I. *Area and Production of Cereal Crops, 1929-1938*

Year	Barley		Hard wheat		Soft wheat		Oats		Maize		Rye		Sorgho	
	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)	Area sown (hectares)	Production (tons)
1929	1,431,000	880,600	1,250,000	688,900	286,000	217,600	259,000	214,600	9,500	6,870	1,383	1,220	16,800	13,560
1930	1,477,000	831,400	1,331,000	622,300	299,000	260,600	257,000	240,400	9,800	7,400	1,814	1,635	15,900	10,370
1931	1,286,000	589,300	1,181,000	507,400	292,000	190,700	226,000	119,200	9,700	6,040	1,366	929	14,300	9,430
1932	1,351,000	672,800	1,191,000	568,100	321,000	227,600	197,000	126,400	8,200	5,520	1,292	670	14,000	7,960
1933	1,306,000	783,600	1,233,000	604,900	383,000	266,000	183,000	140,800	9,900	5,780	1,228	732	24,000	10,180
1934	1,267,000	974,400	1,195,000	772,200	452,000	412,400	182,000	172,600	7,700	7,160	1,317	1,145	10,300	6,000
1935	1,256,000	718,900	1,256,000	665,500	401,000	247,200	176,000	105,800	6,300	4,010	1,026	441	10,700	6,390
1936	1,262,000	641,800	1,308,000	507,600	426,000	302,700	191,000	175,500	6,400	3,470	1,460	736	12,200	7,430
1937	1,252,000	598,100	1,300,000	612,600	444,000	291,200	193,000	138,800	6,400	3,560	1,298	941	9,800	3,040
1938	1,145,000	580,200	1,210,000	623,400	430,000	322,800	182,000	158,100	5,900	4,250	1,871	1,123	9,700	5,910

TABLE II. *Production of Main Cereal Crops by Arrondissements, 1937*

<i>Arrondissement</i>	<i>Barley (tons)</i>	<i>Wheat (tons)</i>	<i>Oats (tons)</i>	<i>Maize (tons)</i>
Oran	33,278	54,535	17,865	382
Mascara	18,301	56,362	16,659	112
Mostaganem	85,202	105,635	24,840	276
Sidi bel Abbès	19,420	68,805	14,683	71
Tlemcen	30,179	30,596	11,262	312
Algiers	42,797	50,684	11,799	164
Médéa	19,468	22,131	1,127	110
Miliana	38,158	80,865	13,564	47
Orléansville	33,807	31,126	2,288	110
Tizi Ouzou	8,404	8,672	834	33
Constantine	93,202	175,134	8,831	84
Batna	30,606	23,836	364	289
Bône	5,650	17,113	2,693	465
Bougie	15,636	12,419	830	689
Guelma	17,212	40,885	1,663	221
Philippeville	9,151	21,137	3,440	73
Sétif	92,700	100,941	6,095	55

TABLE III. *Area and Production of some Non-Cereal and Fruit Crops, 1929-1938*

Year	Tobacco		Cotton	Potatoes		Vines		Olives	Dates
	Area sown (hectares)	Production (tons)		Area sown (hectares)	Production (tons)	Area sown (hectares)	Production of wine (hectolitres)		
1929	21,600	20,200	1,689	22,900	92,100	226,000	11,500,000	245,000	149,000
1930	23,200	19,800	1,161	23,900	89,600	271,000	12,000,000	253,000	225,000
1931	22,900	18,100	893	21,500	75,800	312,000	14,100,000	152,000	128,600
1932	24,100	18,400	118	19,900	89,500	353,000	18,200,000	294,000	131,200
1933	16,900	13,100	135	15,800	100,300	373,000	16,700,000	150,000	102,000
1934	23,000	22,200	..	13,900	96,400	388,000	22,000,000	91,000	103,800
1935	23,000	18,900	..	15,800	96,700	400,000	18,900,000	160,000	72,900
1936	22,100	17,600	..	16,800	115,900	390,000	14,100,000	143,000	129,400
1937	23,700	17,600	227	18,100	131,500	395,000	15,400,000	72,000	105,600
1938	23,300	18,900	..	..	..	399,000	21,500,000	175,000	100,600

TABLE IV. *Production of Dried Vegetables by Arrondissements, 1937*

<i>Arrondissement</i>	<i>Dried peas (tons)</i>	<i>Chick peas (tons)</i>	<i>Lentils (tons)</i>	<i>Peas ¹ (tons)</i>	<i>French beans (tons)</i>
Oran . . .	2,109	1,617	14	231	20
Mascara . . .	6	90	13	9	..
Mostaganem . . .	70	469	82	..	11
Sidi bel Abbès . . .	173	103	35	33	3
Tlemcen . . .	705	1,608	1	117	27
Algiers . . .	331	494	78	6	106
Médéa . . .	32	53	29	5	9
Miliana . . .	68	172	352	50	18
Orléansville . . .	10	64	13	49	8
Tizi Ouzou . . .	65	211	14	45	37
Constantine . . .	29	1,005	21	189	..
Batna . . .	..	..	..	..	..
Bône . . .	92	507	52	..	30
Bougie . . .	104	82	133	58	41
Guelma . . .	7	488	11	..	..
Philippeville . . .	94	408	..	9	42
Sétif . . .	11	7	2	..	..
TOTALS					
Oran (department) .	3,063	3,887	145	390	61
Algiers (department).	506	994	486	155	178
Constantine (depart- ment)	337	2,497	219	256	113
Algeria (excluding Territoires du Sud)	3,906	7,378	850	801	352

¹ i.e. *gesses* (dried peas mainly used as fodder).

TABLE V. *Production of Fruits and Fruit Products by Arrondissements, 1937*

<i>Arrondissement</i>	<i>Wine (hectolitres)</i>	<i>Olives (tons)</i>	<i>Olive-oil (hectolitres)</i>	<i>Oranges (tons)</i>	<i>Tangerines (tons)</i>	<i>Other citrus fruits (tons)</i>	<i>Figs (tons)</i>
Oran	4,018,000	5,946	6,035	11,590	7,842	568	852
Mascara	635,000	1,971	1,141	1,484	1,145	93	1,980
Mostaganem	2,260,000	2,929	1,871	5,838	698	50	2,432
Sidi bel Abbès	1,215,000	1,506	2,250	4	..	..	92
Tlemcen	837,000	3,857	6,200	1,351	187	100	673
Algiers	4,328,000	16,081	16,841	18,701	16,450	803	6,560
Médéa	204,000	194	274	..	..	..	148
Miliana	285,000	1,921	994	310	66	30	487
Orléansville	166,000	517	246	636	42	298	2,160
Tizi Ouzou	290,000	2,075	2,808	982	236	96	23,422
Constantine . . . . .	..	1,466	1,456	6	..	..	487
Batna . . . . .	..	320	364	32	8	7	334
Bône	694,000	142	142	4,962	3,168	806	720
Bougie	272,000	17,842	24,594	843	129	53	27,694
Guelma	5,000	136	202	484	139	..	288
Philippeville	211,000	4,938	4,988	3,292	8,218	929	191
Sétif	4,000	763	984	92	31	..	814

TABLE VI. *Number of Livestock, 1928-1937*

Year		Sheep	Goats	Cattle	Horses	Mules	Asses	Camels	Pigs
1928	.	5,614,000	2,920,000	887,000	164,000	164,000	279,000	173,000	89,000
1929	.	6,196,000	3,050,000	897,000	163,000	165,000	296,000	185,000	89,000
1930	.	7,172,000	3,267,000	938,000	173,000	169,000	302,000	201,000	87,000
1931	.	4,671,000	2,631,000	872,000	167,000	169,000	305,000	210,000	83,000
1932	.	5,260,000	2,743,000	893,000	170,000	170,000	319,000	201,000	86,000
1933	.	5,262,000	2,654,000	896,000	168,000	175,000	332,000	169,000	66,000
1934	.	5,514,000	2,830,000	884,000	171,000	177,000	332,000	170,000	51,000
1935	.	5,845,000	2,807,000	850,000	173,000	181,000	349,000	179,000	60,000
1936	.	6,416,000	2,922,000	840,000	181,000	189,000	359,000	181,000	56,000
1937	.	6,267,000	2,912,000	842,000	185,000	189,000	350,000	173,000	56,000
Oran (department)	.	1,534,000	564,000	183,000	65,000	62,000	90,000	9,000	29,000
Algiers (department)	.	1,079,000	676,000	246,000	40,000	41,000	92,000	8,000	15,000
Constantine (department)	.	2,034,000	966,000	389,000	70,000	83,000	120,000	10,000	12,000
Territoires du Sud	.	1,620,000	706,000	23,000	10,000	3,000	48,000	145,000	300

TABLE VII. *Distribution of Livestock by Arrondissements, 1937*

<i>Arrondissement</i>	<i>Sheep</i>	<i>Cattle</i>	<i>Horses</i>	<i>Mules</i>	<i>Asses</i>
Oran . . .	114,000	24,000	12,000	16,000	8,000
Mascara . . .	463,000	31,000	13,000	10,000	21,000
Mostaganem . . .	660,000	88,000	23,000	12,000	35,000
Sidi bel Abbès . . .	141,000	10,000	9,000	10,000	9,000
Tlemcen . . .	156,000	30,000	8,000	13,000	17,000
Algiers . . .	449,000	88,000	22,000	19,000	30,000
Médéa . . .	305,000	27,000	4,000	3,000	15,000
Miliana . . .	155,000	49,000	7,000	7,000	14,000
Orléansville . . .	122,000	48,000	6,000	6,000	16,000
Tizi Ouzou . . .	49,000	34,000	1,000	5,000	17,000
Constantine . . .	833,000	118,000	31,000	27,000	38,000
Batna . . .	605,000	29,000	10,000	11,000	27,000
Bône . . .	37,000	66,000	5,000	4,000	4,000
Bougie . . .	65,000	55,000	2,000	8,000	21,000
Guelma . . .	147,000	55,000	6,000	6,000	6,000
Philippeville . . .	33,000	32,000	4,000	5,000	3,000
Sétif . . .	312,000	34,000	13,000	22,000	21,000

APPENDIX B

OIL INSTALLATIONS IN ALGERIA

<i>Place</i>	<i>Company</i>	<i>Storage capacity in cubic metres</i>	<i>Number of tanks</i>
ON THE COAST			
Algiers (Harrach)	Shell	32,490	9
	C ^{ie} Algérienne des Pétroles Standard	27,500	13
	Soc. Algérienne des Huiles Minérales	8,800	4
	Soc. Banale des Docks de Pétrole de l'Afrique du Nord	8,300	7
	C.I.P.A.N.	6,888	4
Algiers (Hussein Dey)	Raffinerie du Midi	4,900	2
	C ^{ie} Africaine des Raffineries de Berre	20,000	9
	Shell	12,750	6
Algiers (Maison Carrée)	..	..	5 (possibly 12): new installation
Algiers (Port)	Soc. Algérienne des Pétroles Mory	28,000	5
	Venture Weir	16,441	2 tankers used as oil hulks: removed during 1940
	Shell	3,390	4
	Soc. Algérienne des Pétroles Standard (Bedford Petroleum Co.)	3,080	4
	Raffinerie du Midi	8,739	5
Arzeu	C.I.P.A.N.	6,389	4
	C ^{ie} Algérienne des Huiles Minérales	4,600	5
	Soc. Anonyme Française des Pétroles Shell	14,000	4
Bône	C ^{ie} Algérienne des Pétroles Standard	6,000	3
	C.I.P.A.N.	3,906	4
	Soc. Algéronaphte	3,400	3
	Soc. Algérienne des Huiles Minérales	3,200	3
	Raffinerie du Midi	(?) c. 350	2
Bougie	Shell	2,790	2
Djidjelli	Shell	100	2
Mostaganem	Shell	3,000	2
	Shell	300-400	4 or 5
	Compolise emulsion factory	50-60	2 or 3
Oran (Mers el Kebir)	C ^{ie} Algérienne des Pétroles Standard	11,200	5
	French Navy	Information not available	
Oran (Port)	French Navy	40,000-	12 or 13
		50,000	
	Soc. Générale des Huiles de Pétroles (S.G.H.P.)	29,700	4

<i>Place</i>	<i>Company</i>	<i>Storage capacity in cubic metres</i>	<i>Number of tanks</i>
Oran (Port) (<i>contd.</i>)	Soc. Algérienne des Huiles Minérales	28,500	3
	Shell Marine	10,033	8
	Soc. Algéronaphte	4,350	3
Oran (Victor Hugo)	Shell	16,890	6
Philippeville	Shell	2,790	Depot for packed oils only
IN THE INTERIOR ¹			
Affreville	Shell	400	5
Ain Témouchent	"	350	4
Batna	"	350	3
Blida	"	700	5
Bordj bou Arréridj	"	150	3
Châteaudun du Rummel	"	300	3
Constantine	"	556	4
Guelma	"	300	6
Mascara	"	300	6
Orléansville	"	770	4
Relizane	"	300	3
Saida	"	300	6
Sétif	"	300	6
Sidi bel Abbès	"	300	3
Tiaret	"	300	6
Tizi Ouzou	"	300	3
Tlemcen	"	300	3

¹ For the interior, information is not available for depots belonging to companies other than the Shell Company.

APPENDIX C

COMMERCIAL STATISTICS

- Table I. Foreign Trade by Countries, 1931-1938.
- „ II. Principal Exports from Algeria, 1937-1938, with Principal Destinations, 1937.
- „ III. Principal Imports to Algeria, 1937-1938, with Principal Sources of Supply, 1937.
- „ IV. Imports of Mineral Oils to Algeria, 1935-1937.

TABLE I. *Foreign Trade by Countries, 1931-1938*

(Figures in thousands of francs)

	France	French colonies and protectorates	U.K.	Germany	Belgium and Luxemburg	Netherlands ¹	Spain	Italy	U.S.S.R.	U.S.A.	Brazil	Total ²
1931	Imports 3,772,089 Exports 2,820,827	248,455 286,013	90,358 86,468	88,565 16,693	48,002 17,206	40,509 31,497	42,749 15,944	29,122 37,069	15,307 ..	108,055 32,123	72,530 9	4,871,519 3,402,267
1932	Imports 3,065,116 Exports 3,340,537	175,508 203,057	93,614 71,141	50,344 16,810	36,484 10,078	39,103 14,548	39,884 13,480	22,223 28,907	13,947 214	60,960 23,975	74,607 ..	3,906,110 3,747,236
1933	Imports 3,358,829 Exports 3,428,214	162,865 162,372	74,828 83,544	26,859 17,196	26,617 12,944	32,073 24,153	25,147 11,472	21,244 27,857	12,550 6	42,771 16,272	63,221 ..	4,071,660 3,817,271
1934	Imports 2,904,921 Exports 2,215,009	172,752 157,155	68,176 95,053	23,100 24,007	23,245 11,244	21,209 17,803	22,497 9,871	22,039 35,793	9,517 213	39,929 13,593	41,620 1	3,575,549 2,626,666
1935	Imports 2,290,025 Exports 2,235,009	164,543 94,944	50,513 93,604	21,078 19,563	17,206 13,689	22,938 10,618	10,131 9,850	12,708 49,690	10,194 273	31,261 28,814	48,282 ..	2,844,227 2,613,366
1936	Imports 2,602,267 Exports 3,002,947	237,243 163,911	51,837 122,931	21,081 39,416	20,544 18,236	19,446 8,262	15,453 14,976	5,639 6,658	5,481 1,134	36,290 36,682	53,432 31	3,233,796 3,469,279
1937	Imports 3,124,987 Exports 3,558,991	352,119 192,507	68,818 241,241	35,031 93,872	46,529 39,305	26,851 14,482	4,851 2,886	15,264 36,300	737 492	63,545 75,425	57,363 359	4,083,383 4,333,599
1938	Imports 3,751,902 Exports 4,706,686	490,994 236,682	120,755 267,996	41,102 117,366	49,401 40,067	25,897 33,246	899 11,458	16,160 25,108	3,353 6,823	83,111 96,725	69,825 188	4,995,178 5,638,787

¹ Including Dutch colonies.

² Including countries not named.

TABLE II. *Principal Exports from Algeria, 1937-1938, with Principal Destinations, 1937*

Commodity	Unit	1937		1938		Principal destinations (% of value of each item of exports) 1937	
		Quantity	Value in thousands of francs	Quantity	Value in thousands of francs		
<i>Animal products and foodstuffs</i>							
Sheep . . .	head	830,253	116,456	863,326	148,295	France	100
Horses . . .	„	34,077	36,360	..	..	France	99
Meat, fresh or frozen	tons	1,960	17,289	..	..	France	97
Hides and skins .	„	4,657	47,279	4,626	46,242	France	51
						U.S.A.	30
						U.K.	10
Wool . . .	„	13,248	87,395	10,723	76,530	France	71
						Belgium	6
						Germany	6
						Tunisia	5
Fish, fresh and preserved	„	10,650	57,382	5,767	41,448	France	71
						Italy	23
Wheat, hard .	„	96,563	151,602	54,855	104,773	France	96
Wheat, soft .	„	64,708	107,412	41,910	84,658	France	96
Barley . . .	„	19,141	22,786	17,877	22,346	France	94
Wheat flour .	„	23,874	57,294	28,251	79,384	France	95
Groats and semolina	„	67,570	168,243	69,014	200,832	France	99
Potatoes . . .	„	78,929	65,509	77,453	103,013	France	97
Fresh vegetables.	„	73,888	90,213	61,199	115,466	France	100
Fruit, fresh, dried, or preserved	„	111,824	267,642	128,982	326,730	France	98
Olive-oil . . .	„	8,679	74,241	24,381	192,021	<i>Edible oil</i>	
						France	49
						U.S.A.	17
						U.K.	12
						Italy	10
						<i>Commercial oil</i>	
						U.S.A.	46
						France	33
Wine . . .	hecto-litres	12,283,306	1,936,896	16,707,272	2,851,537	France	98
Spirits ¹ . . .	„	11,873	7,125	184,129	125,576	France ²	97
<i>Other vegetable products</i>							
Esparto grass .	tons	227,875	91,152	182,495	74,823	U.K.	94
Tobacco . . .	„	15,176	101,927	18,250	116,766	France	5
						<i>Leaf tobacco</i>	
						France	94
						<i>Cigarettes</i>	
						French Indo-China	65
						French West Africa	11
Vegetable fibre .	„	23,401	12,877	..	..	Germany	33
						Italy	23
						France	17
						Belgium	12

¹ Of pure alcohol.² In 1938.

Commodity	Unit	1937		1938		Principal destinations (% of value of each item of exports) 1937
		Quantity	Value in thousands of francs	Quantity	Value in thousands of francs	
Cork, crude, sheets, and waste	tons	42,839	73,439	41,858	67,182	U.S.A. 37 France 35 Sweden 6
Cork manufactures	„	3,180	27,170	4,103	33,822	France 95
<i>Minerals</i>						
Iron ore . . .	„	2,556,410	224,963	2,754,614	127,080	U.K. 55 Germany 30
Zinc ore . . .	„	17,668	12,049	8,830	..	Belgium 95 France 5
Lead ore . . .	„	7,985	7,531	8,880	..	Tunisia 42 Belgium 42 France 16
Manganese ¹ . .	„	6,822	2,047	..	..	France 83 Belgium 17
Phosphates . .	„	572,308	45,786	485,579	44,188	France 36 Germany 27 Eire 11
Superphosphate .	„	23,543	8,842	19,100	..	Egypt 53 Tunisia 17
Diatomaceous earth (kieselguhr)	„	14,107	..	15,410	..	Belgium 13 France 35 U.K. 32
Salt	„	41,409	6,627	42,930	..	Belgium 23 France 62 Finland 12 U.S.A. 11

¹ Concentrates from French Moroccan ore.

TABLE III. *Principal Imports to Algeria, 1937-1938, with Principal Sources of Supply, 1937*

Commodity	Unit	1937		1938		Principal sources of supply (% of value of each item of exports) 1937	
		Quantity	Value in thousands of francs	Quantity	Value in thousands of francs		
Metal goods							
Iron and steel .	tons	93,651	99,551	77,533	112,083	France	99
Machinery .	„	20,086	208,910	20,367	252,327	France ¹	75
Cars and chassis	„	7,051	128,953	7,911	149,434	France	100
Other vehicles, including bicycles	„	3,241	3,028	2,843	3,320	France ¹	96
Other metal goods	„	45,643	189,162	44,129	197,041	France ¹	97
Textiles							
Cotton tissues .	„	10,957	290,826	13,095	383,095	France	100
Rayon tissues .	„	821	68,234	996	104,230	France	95
						Japan	3

¹ In 1938.

Commodity	Unit	1937		1938		Principal sources of supply (% of value of each item of exports) 1937
		Quantity	Value in thousands of francs	Quantity	Value in thousands of francs	
Jute and woollen goods	tons	10,238	66,969	8,692	67,706	Wool France 82 Tunisia 12 French Morocco 6 Jute France 97 France 97
Ready-made clothing	"	3,087	50,635	3,165	55,219	France 97
Yarns . . .	"	6,156	58,864	5,709	51,630	France 98
Coal and oil						
Coal . . .	"	709,521	80,906	701,178	105,616	U.K. 63 Germany 20 French Morocco 9
Petrol and kerosene ²	hecto-litres	2,041,936	63,950	2,138,334	97,443	Petrol France 65 Roumania 34 Kerosene France 89 Roumania 9
Other oils . .	tons	95,594	38,439	92,756	69,168	Lubricating oils France 66 U.S.A. 30 Residual oils France 32 Roumania 30 Iran 19 Netherlands West Indies 9
Food and drink						
Rice and rice flour	"	48,928	45,696	54,282	62,790	French Indo-China 67 France 29
Sugar . . .	"	81,849	193,724	85,170	252,667	France 96
Coffee . . .	"	14,594	63,495	15,687	68,493	Brazil 79 Netherlands East Indies 13
Cheese, butter, and milk	"	7,565	81,830	7,656	96,030	France 98
Meat, fresh, frozen, and salt	"	3,433	41,261	4,495	55,741	France 95
Live cattle .	head	16,438	32,281	26,505	53,519	French Morocco 64 Tunisia 28
Live sheep .	"	176,512	29,279	128,078	34,874	French Morocco 83 Tunisia 17
Other imports						
Perfumery and soap	tons	23,412	113,054	23,901	129,010	France ¹ 99
Medicines .	"	1,826	57,168	2,125	65,805	France 99

¹ In 1938.² For a more detailed analysis of these imports, see Table IV (below).

Commodity	Unit	1937		1938		Principal sources of supply (% of value of each item of exports) 1937
		Quantity	Value in thousands of francs	Quantity	Value in thousands of francs	
Timber . . .	tons	134,042	92,690	132,094	102,114	Round, hewn, and sawn France 52 Yugoslavia 21 Sweden 12 Other wood France 32 Italy 29 U.S.A. 18 France ¹ 98
Furniture and other wooden articles	„	14,810	59,729	13,689	54,458	France ¹ 96
Paper and paper goods	„	29,819	119,004	27,225	117,656	France 95
Leather and leather goods	„	3,596	72,273	3,732	79,231	France 88 Belgium 10
Rubber goods .	„	3,090	53,009	4,508	87,534	France 82 French West Africa 16
Ground-nut oil .	„	29,536	115,659	30,877	120,097	

¹ In 1938.TABLE IV. *Import of Mineral Oils to Algeria, 1935-1937*

Type	1935	1936	1937		
	Quantity (tons)	Quantity (tons)	Quantity (tons)	Value (thousands of francs)	Main sources
Motor spirit . . .	114,059	114,693	114,053	49,956	Controlled factories ¹ 65% Roumania 34%
Kerosene	42,201	44,773	38,103	13,990	Controlled factories ¹ 89% Roumania 9%
Lubricating oils .	8,984	10,522	12,486	17,812	Controlled factories ¹ 50% U.S.A. 30% France 16%
Residual oils (including gas, diesel, and fuel oils) (excluding re-exports)	77,748	79,429	83,104	20,626	Controlled factories ¹ 32% Roumania 30% Iran 19% Curaçao 9% Netherlands East Indies 6%
Re-exports of gas and fuel oil (bunkering)	331,840	338,954	442,273	..	..

¹ i.e. foreign oil re-exported from French entrepôt refineries.

APPENDIX D

NOTE ON THE TRANS-SAHARAN RAILWAY

THE project of a railway link between French North Africa and the French Soudan has been under consideration for nearly seventy years. Following a scheme proposed by A. Duponchel in 1876 the French Government appointed a commission in 1879 to study the question of railway communication in southern Algeria and French West Africa.

Three missions were dispatched to prospect the route which a trans-Saharan railway might follow. The Pouyanne mission worked in the extreme south of the department of Oran, but, owing to the hostility of the tribes, was unable to advance beyond Touat. Pouyanne reported favourably on the project of a railway 'as far as the southern end of Touat and perhaps much farther'. The Choisy mission's task was to report on the possibility of two parallel lines, from Laghouat to el Goléa and from Biskra to Ouargla. The mission reached el Goléa from Laghouat and returned by Ouargla and the Oued Rir to Biskra. The third mission, that of Lieutenant-Colonel Flatters, was ordered to find a route for the proposed railway across the Ahaggar to the Soudan: it advanced from Ouargla along the Igharghar beyond which it was stopped by the hostility of the Ajjer Touareg: it brought back much surveying and other scientific information. Disregarding the hostile reception Flatters set out on another mission in the following year: the party was massacred. The disaster convinced the French Government that no further steps could be taken for the construction of the railway until the Sahara was effectively occupied and subdued; accordingly the project was held in abeyance.

In 1890 the region between Algeria and the Soudan was definitely recognized to be within the French sphere of influence, and interest in the penetration of the Sahara was revived. Georges Rolland, a member of the Choisy mission, started a campaign for a trans-Saharan railway and, with General Philibert, published a book urging the construction of a railway to join Algeria to Lake Chad by way of Biskra and Ouargla. The scheme attracted a good deal of attention, particularly in Algeria, where, unfortunately, it gave rise to strong rivalries between the three departments for the possession of the terminus of the proposed line. Broussais proposed a route from Algiers via Laghouat and el Goléa, and Sabattier a line from Oran via Touat. Virtually nothing more was known of the interior than in 1880.

Interest was revived in France by the Fashoda incident of 1898. Three missions were organized in that year to converge upon Lake Chad: the first, under Foureau and Commandant Lamy, started from Ouargla; the second, under Voulet and Chanoine (subsequently under the orders of

Captain Jolland), went by way of the Soudan; the third, under Gentil and Bretonnet, travelled northward by the Congo and Chari river systems. Other missions followed, including that of G. Flamand, who was ordered to study the commercial routes between Algiers, Touat, and the Soudan.

A fresh campaign for a trans-Saharan railway was engendered in which Lerry-Beaulieu played a prominent part: he published a book on the subject in 1904. Attention was now focused on the political and strategic value of such a railway. There was considerable opposition, but the construction of lines through the southern semi-deserts of northern Algeria lent weight to the view that a trans-Saharan line was possible.

Numerous suggestions were put forward; two of them, published in 1911, were worthy of serious consideration. Souleyre proposed a route via the Oued Igharghar, and Berthelot favoured the route of the Oued Saoura and Touat: both routes converge on Silet. Further missions, under the auspices of the Société d'Études du Chemin de fer Transafricain, formed by Berthelot, proved that there were no difficulties in constructing a trans-Saharan line so far as terrain was concerned, that over the greater part of the route the line could be laid upon the ground, and that few engineering works were required on the remaining sections.

By the outbreak of war in 1914 the trans-Saharan line had ceased to be regarded as a mere extension of the Algerian railways across the Sahara and had become part of a political and strategic scheme of international importance. It was considered to be a means of unifying French military and commercial requirements in northern and western Africa; of assisting strategic control and perhaps economic development of the western Anglo-Egyptian Sudan and adjacent French territory; and as a route alternative to the Nile valley, if the latter were interrupted. There was also the possibility of improved access to the Chad-Chari-Congo regions, the Belgian Congo, British East Africa and the Indian Ocean, and Madagascar. The claims of the western Anglo-Egyptian Sudan have received less attention than the possibilities of a trans-African line through el Fasher to the Red Sea at Port Sudan by the system east of el Obeid. These far-flung adjuncts of the proposed trans-Saharan railway have taken shape and grown with the passage of time, and to them must be added the shortening of communications from Europe to South America through the ports of western Africa: the saving would amount to about 1,740 miles of sea passage.

It will be observed that the proposed trans-Saharan line thus became a means of securing strategic ends on the one hand, and fast transit to equatorial Africa, the Indian Ocean, and South America on the other: speed, therefore, became its key-note rather than trade.

After the War of 1914-1918 the project of the trans-Saharan railway again became prominent, and was related to experience of strategic needs felt during the war. In 1923 the Conseil supérieur de la Défense nationale demanded the construction of a railway joining north Africa to west Africa starting from Oran and running via Colomb Béchar and Adrar to the Niger

river at Tosaye and ending in the region of Ouagadougou. Normal gauge of 4 ft. 8½ in. (1.435 m.) and internal-combustion (Diesel) engines (without prejudice to the possibilities of electrification) were specified.

In 1927 various bodies, including the Comité de l'Afrique Française and certain chambers of commerce, expressed the view that the trans-Saharan line should be undertaken forthwith. A bill was presented to the Chamber offering 18 million francs for a technical survey of the route: the bill established the Organisme d'Études du Transsaharien. In the winter of 1928-1929 itineraries were reconnoitred, and a comprehensive and extremely detailed report on all questions affecting the line was prepared. The financial crisis prevented the scheme being put into operation, and no suitable opportunity occurred in the ten years intervening between the crisis and the outbreak of the present war.

The route adopted by the Organisme d'Études du Transsaharien runs from Bou Arfa through the Saoura and Touat and straight to the Niger at Gao, where one branch goes to Timbuktu, and joins the rail to Dakar at Koulikoro, and another branch follows the Niger to Niamey. A branch, Adrar-el Goléa-Touggourt, is planned to join the line to the railways of the departments of Algiers and Constantine by the existing Touggourt-Biskra line.

The Ministry of Public Works proposed to establish a concessionaire-company, the Société nationale des Chemins de fer Français, having as its principal members the State, Algeria, and the colonies concerned. A later proposal was for a self-governing office appealing for public investments with a State guarantee. Exploitation would be in the hands of the company envisaged by the Ministry of Public Works.

An extensive scheme of irrigation in the Niger bend, part of it in course of development, is considered likely to provide carrying trade for the railway (cotton and cereals) and to lead to a great increase of population such as that of Egypt. The course of the line is not unduly difficult from a constructional point of view, both mountains and dune belts being avoidable, and lack of water is overcome by the elimination of steam engines. The supporters of the trans-Saharan railway have maintained that after a few years it would carry 400,000 tons of goods and 70,000 passengers annually. These figures are, however, strongly contested by opponents of the scheme who claim that the Sahara can contribute virtually nothing, and that the Soudan is well served by railways and other communications which lead naturally to Atlantic ports.

In the years immediately prior to the present war trans-Saharan air services were fast becoming thoroughly established: they already penetrated beyond the Sahara throughout the length of Africa and crossed the Atlantic to South America, there linking with the air services of the whole of the western hemisphere. These services deal almost exclusively with the type of passenger and mail that the trans-Saharan railway would have carried.

It seems, therefore, that the proposed line would serve only strategic

purposes, and these within a few years might be adequately served by air and motor transport. The future of the scheme may turn, therefore, once more on the facility of conveying heavy traffic not suited to air or motor transport: it would compete thereby with the already established railways supplying the west African ports and the seaborne trade of Britain and France. Nevertheless a case for the construction of the line remains, for the French as an 'imperial road', for other nations and the French themselves as a contribution to African and world communications. There is little doubt that, had the line been constructed, it would have been of much service to France and Great Britain in the present war, and to Vichy France and Germany before the Allied landings in French North Africa.

In 1941 the Vichy Government decided to undertake the construction of a line known as the *Chemin de fer Méditerranée-Niger* to link up the railway system of French Morocco through Algeria with the railways of French West Africa. The existing normal-gauge line from Oudjda to Bou Arfa in Morocco has been extended to Colomb Béchar in Algeria and to Kenadza. This section has already been completed and opened. The section from Colomb Béchar to Kenadza duplicates the narrow-gauge section of the line from Oran, part of the Algerian railway system. From Kenadza it was proposed to continue the line to Beni Abbès and beyond to In Tassit, with branches to connect with the railways of Senegal and the River Niger. As far as information is available, the section from Kenadza to Beni Abbès was started in the early part of 1942 and had reached a point 20 miles (33 km.) south of Kenadza by 15 July 1942, when work was stopped owing to shortage of permanent-way material, transport and labour difficulties, and scarcity of water.

Few details about the line are available, and those given here apply only to conditions and plans up to 1942. It was stated that a heavy type of rail, weighing 101 lb. (46 kg.) per metre, would be used. Timber sleepers would be adopted as far south as the northern limit of the Soudan region and beyond that either metal or concrete sleepers, because of the destructive action of tropical insects (e.g. white ant) on timber. Diesel-electric locomotives will probably be used when the line is completed, being capable of covering the whole distance without encountering refuelling difficulties. At present the goods trains running over the section from Kenadza to Bou Arfa are worked by steam locomotives, and passenger services are operated with Diesel railcars.

APPENDIX E

NOTE ON

LITERATURE, MAPS AND CHARTS, AND AUTHORSHIP

LITERATURE

Reference should be made to Vol. I, Appendix H: general books, atlases, and maps noted there are not repeated here. The following list includes some of the books and articles that have been found useful in the preparation of this volume, together with certain books which are not at present available in this country.

GENERAL

ALZOUNE, C. *L'Algérie* (Paris, 1940).

CORTOT, E. *France d'Afrique* (Paris, 1930).

PIQUET, V. *L'Algérie Française* (Paris, 1930).

Annuaire statistique de l'Algérie (Algiers, annual).

Exposé de la situation générale de l'Algérie (Algiers, annual).

See also Vol. I, p. 270.

ADMINISTRATION

GIRAULT, A. *Principes de colonisation et de législation coloniale*. Tome iv, L'Afrique du Nord. I. L'Algérie (6th edition) (Paris, 1933).

POPULATION AND GAZETTEER

JOLEAUD, L. *Constantine et l'Algérie orientale* (Congrès de l'Association française pour l'avancement de Science, Constantine, 1927).

MERCIER, M. *La Civilisation urbaine au Mzab: étude de sociologie africaine* (Algiers, 1922).

Guide Books, see Vol. I, p. 273.

PORTS

BERNARD, A. 'Oran, port du Maroc et du Sahara', *Bulletin de la Société de Géographie d'Oran*, xlix (1928), p. 83.

LESPÈS, R. 'Le Port d'Alger', *Annales de Géographie*, xxx (1921), p. 195.

—— *Alger, étude de géographie et d'histoire urbaines* (Paris, 1930).

—— *Oran, étude de géographie et d'histoire urbaines* (Paris, 1938).

Mediterranean Pilot, vol. i (7th edition) (Hydrographic Department, Admiralty, London, 1937).

ECONOMIC GEOGRAPHY (excluding communications)

- BÉTIER, G. 'Aperçu de l'état actuel de mise en valeur des richesses minérales de l'Algérie', *Revue de l'Industrielle Minérale* (1930), p. 313.
- BOVILL, E. W. *Caravans of the Old Sahara* (London, 1933).
- DEMONTÈS, V. *Renseignements sur l'Algérie économique* (Paris, 1922).
- *L'Algérie industrielle et commerçante* (Paris, 1930).
- DUSSERT, D., and BÉTIER, G. *Les Mines et les carrières en Algérie* (Paris, 1932).
- MANQUENÉ, J. *La Plaine du Chélif et les grands barrages* (Algiers, 1934).
- SHANTZ, H. L., and MARBUT, C. F. *The Vegetation and Soils of Africa* (2 vols.) (New York, 1923).
- WELSCH, O. 'Neue Bewässerungsanlagen in Algerien', *Geographische Zeitschrift*, xlv (1938), p. 97.
- Department of Overseas Trade Report: 'Algeria, 1936'* (London, 1937), and earlier issues.
- Documents statistiques sur le commerce de l'Algérie* (Algiers, annual).
- La Chronique des mines coloniales* (Bureau d'études géologiques et minières coloniales) (Paris, monthly).
- La Géologie et les mines de la France et d'Outre-Mer* (Paris, 1932).
- Les Ressources minérales de la France d'outre-mer* (5 vols.) (Paris, 1933–1937).

COMMUNICATIONS

- DEMOULIN, F. 'Les Communications Sahariennes voies d'Empire', *Annales de Géographie*, xlviii (1939), p. 481.
- GAUTIER, E. F. 'The Trans-Saharan Railway', *Geographical Review*, xv (1925), p. 51.
- Guide du tourisme automobile et aérien au Sahara* (Algiers, 1938).
- Handbook of Railways in Africa*, vol. i (Naval Staff, Intelligence Department, London, 1919).
- Periodicals such as *The Railway Gazette* (London, weekly), *The Railway Magazine* (London, monthly), and *Modern Transport* (London, weekly).

MAPS AND CHARTS

Reference should be made to Vol. I, pp. 273–274 and Fig. 4. The following Michelin maps have also been used:

- Africa road maps (G.S., G.S. No. 4256), Sheet 151, Maroc–Algérie–Tunisie (1 : 2,000,000 and 1 : 500,000), and Sheet 152, Pistes du Sahara (1 : 4,000,000).

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APPENDIX F

CONVERSION TABLES

METRIC AND BRITISH UNITS

All metallic standards are subject to molecular change. Tables differ according to the date of the comparison on which they rest. These are based on the 1896 comparison between Yard and Metre, which gives:

$$1 \text{ metre} = 39.370113 \text{ inches.}$$

Tables 1 to 6 give the ratios between units of the same sort.

Space, and printing, deny the use of many decimal figures. Therefore such a figure as 0.00000032 is given as 3.2×10^{-7} (which means that the first significant figure is the seventh after the decimal point: 0.0001925 becomes 1.925×10^{-4} , and 0.0000734 is 7.34×10^{-5}).

Tables 7 to 20 give ratios *in extenso* between single units.

These deal with conversions from metric into the equivalent British units.

Figures referring to metric units are given in italics; metric units (1 to 9) are given at the top of each table, reading horizontally from left to right; metric tens read vertically from top to bottom on extreme right and left of the table.

Thus in Table 8, if 87 centimetres are to be converted to inches, the 8 is read on the left or right edge, and, following the horizontal line until the 7 unit column is reached, the answer 34.252 is read.

LIST OF TABLES

1. Units of Length
2. Units of Area
3. Units of Volume
4. Units of Weight
5. Units of Pressure
6. Yields per Area
7. Metres to Feet
8. Centimetres to Inches
9. Kilometres to Statute Miles
10. Square Metres to Square Feet
11. Hectares to Acres
12. Square Kilometres to Square Miles
13. Cubic Metres to Cubic Feet
14. Kilogrammes to Pounds
15. Litres to Gallons
16. Metric Tons to Tons
17. Quintals per Hectare to Tons per Acre
18. Numbers per Square Kilometre to Numbers per Square Mile
19. Degrees Centigrade to Degrees Fahrenheit
20. Millibars, Millimetres of Mercury, and Inches of Mercury

TABLE 1. UNIT OF LENGTH.

Nautical mile	Statute mile	Kilometre	Metre	Yard	Foot	Inch	Centimetre
1	1.152	1.853	1853	2027	†6080	72,960	185,300
8.684×10^{-1}	1	1.60934	1609.34	1760	5280	63,360	160,934
5.396×10^{-1}	6.21372×10^{-1}	1	1000	1093.61	3280.84	39,370.1	100,000
5.396×10^{-4}	6.21372×10^{-4}	1.0×10^{-3}	1	1.09361	3.28084	39.3701	100
4.934×10^{-4}	5.68182×10^{-4}	9.14399×10^{-4}	9.14399×10^{-1}	1	3	36	91.4399
1.645×10^{-4}	1.89394×10^{-4}	3.048×10^{-4}	3.048×10^{-1}	3.33333×10^{-1}	1	12	30.48(00)
1.371×10^{-3}	1.57828×10^{-3}	2.54×10^{-3}	2.54×10^{-2}	2.77778×10^{-2}	8.33333×10^{-2}	1	2.54(000)
5.396×10^{-6}	6.21372×10^{-6}	1.0×10^{-5}	1.0×10^{-2}	1.09361×10^{-2}	3.28084×10^{-2}	3.93701×10^{-1}	1

† This is the customary British practice, and not the international nautical mile, of 1852 metres, which Great Britain has not adopted.

Rough rules: 1 millimetre = 0.04 inch.
1 metre = $\frac{10}{3}$ feet.
1 kilometre = $\frac{5}{8}$ of a mile.

TABLE 2. UNITS OF AREA

Square mile	Square kilometre	Hectare	Acre	Square metre	Square yard	Square foot
1	2.58998	258.998	640	$258,998 \times 10$	$30,976 \times 10^2$	$278,784 \times 10^2$
3.86103×10^{-1}	1	100	247.106	1,000,000	$119,599 \times 10$	$107,639 \times 10^2$
3.86103×10^{-3}	1.0×10^{-2}	1	2.47106	10,000	11,959.9	107,639
1.5625×10^{-3}	4.04685×10^{-3}	4.04685×10^{-1}	1	4046.85	4840	43,560
3.86103×10^{-7}	1.0×10^{-6}	1.0×10^{-4}	2.47106×10^{-4}	1	1.19599	10.7639
3.22831×10^{-7}	8.36126×10^{-7}	8.36126×10^{-5}	2.06612×10^{-4}	8.36126×10^{-1}	1	9
3.58701×10^{-8}	9.29029×10^{-8}	9.29029×10^{-6}	2.29568×10^{-5}	9.29029×10^{-2}	1.11111×10^{-1}	1

Rough rules: 1 square kilometre = $\frac{1}{8}$ square mile.
1 hectare = $2\frac{1}{2}$ acres.

TABLE 3. UNITS OF VOLUME

Kilolitre	Cubic metre	Cubic yard	Bushel	Cubic foot	Imp. gall.	Litre	Pint
1	1·000027	1·30799	27·4969	35·3157	219·976	1000	1759·80
$9·99973 \times 10^{-1}$	1	$1·30795$	27·4962	$35·3148$	219·970	999·973	1759·75
$7·64532 \times 10^{-1}$	$7·64553 \times 10^{-1}$	1	21·0223	27	168·178	764·532	1345·43
$3·63677 \times 10^{-2}$	$3·63687 \times 10^{-2}$	$4·75685 \times 10^{-2}$	1	1·28435	8	36·3677	64
$2·83160 \times 10^{-2}$	$2·83167 \times 10^{-2}$	$3·70370 \times 10^{-2}$	$7·78602 \times 10^{-1}$	1	6·22882	28·3160	49·8306
$4·54596 \times 10^{-3}$	$4·54608 \times 10^{-3}$	$5·94607 \times 10^{-3}$	$1·25 \times 10^{-1}$	$1·60544 \times 10^{-1}$	1	4·54596	8
$1·0 \times 10^{-3}$	$1·000027 \times 10^{-3}$	$1·30799 \times 10^{-3}$	$2·74969 \times 10^{-2}$	$3·53157 \times 10^{-2}$	$2·19976 \times 10^{-1}$	1	1·75980
$5·68245 \times 10^{-4}$	$5·68260 \times 10^{-4}$	$7·43258 \times 10^{-4}$	$1·5625 \times 10^{-2}$	$2·00680 \times 10^{-2}$	$1·25 \times 10^{-1}$	$5·68245 \times 10^{-1}$	1

TABLE 4. UNITS OF WEIGHT

* † Ton	Millier or metric ton	Quintal	Kilogramme	lb.
1	1·01605	10·1605	1016·05	2240
$9·84207 \times 10^{-1}$	1	10	1000	2204·62
$9·84207 \times 10^{-2}$	$1·0 \times 10^{-1}$	1	100	220·462
$9·84207 \times 10^{-4}$	$1·0 \times 10^{-3}$	$1·0 \times 10^{-2}$	1	2·20462
$4·46429 \times 10^{-4}$	$4·53592 \times 10^{-4}$	$4·53592 \times 10^{-3}$	$4·53592 \times 10^{-1}$	1

† The ton of 2240 lb. is sometimes called the “Long Ton” to distinguish it from the “Short Ton” of 2000 lb.
Rough rule: To turn metric into British tons deduct 1½ per cent.

TABLE 5. UNITS OF PRESSURE

<i>Atmosphere normal</i> 760 mm. Hg at 0° C. (g = 980·665 cm. per sec. per sec.)	<i>Bar</i> (= 10 ⁶ dynes per sq. cm.)	<i>lb. per sq. inch</i> (g = 980·665 cm. per sec. per sec.)	<i>Inches of mercury at 32° F.</i> (g = 980·665 cm. per sec. per sec.)	<i>Millibars (1,000</i> <i>dynes per sq. cm.)</i>
<i>I</i> 9·86923 × 10 ⁻¹ 6·80461 × 10 ⁻² 3·34210 × 10 ⁻² 9·86923 × 10 ⁻⁴	1·01325 <i>I</i> 6·89477 × 10 ⁻² 3·38639 × 10 ⁻² 1·0 × 10 ⁻³	14·6959 14·5037 <i>I</i> 4·91153 × 10 ⁻¹ 1·45037 × 10 ⁻²	29·9213 29·5300 2·03603 <i>I</i> 2·95300 × 10 ⁻²	1013·25 1000 68·9477 33·8639 <i>I</i>

TABLE 6. YIELD PER AREA

<i>Ton per acre</i>	<i>Metric ton per hectare</i>	<i>Quintal per hectare</i>
<i>I</i> 3·98294 × 10 ⁻¹ 3·98294 × 10 ⁻²	2·51071 <i>I</i> 1·0 × 10 ⁻¹	25·1071 10 <i>I</i>

CONVERSION TABLES

TABLE 7. METRES TO FEET. 1 metre = 3.28084 feet

	0	1	2	3	4	5	6	7	8	9	
1	..	3.3	6.6	9.8	13.1	16.4	19.7	23.0	26.3	29.5	1
2	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	2
3	65.6	68.9	72.2	75.5	78.7	82.0	85.3	88.6	91.9	95.1	3
4	98.4	101.7	105.0	108.3	111.6	114.8	118.1	121.4	124.7	128.0	4
5	131.2	134.5	137.8	141.1	144.4	147.6	150.9	154.2	157.5	160.8	5
6	164.0	167.3	170.6	173.9	177.2	180.5	183.7	187.0	190.3	193.6	6
7	196.9	200.1	203.4	206.7	210.0	213.3	216.5	219.8	223.1	226.4	7
8	229.7	232.9	236.2	239.5	242.8	246.1	249.3	252.6	255.9	259.2	8
9	262.5	265.8	269.0	272.3	275.6	278.9	282.2	285.4	288.7	292.0	9
10	295.3	298.6	301.8	305.1	308.4	311.7	315.0	318.2	321.5	324.8	10
11	328.1	331.4	334.6	337.9	341.2	344.5	347.8	351.0	354.3	357.6	11
12	360.9	364.2	357.5	370.7	374.0	377.3	380.6	383.9	387.1	390.4	12
13	393.7	397.0	400.3	403.5	406.8	410.1	413.4	416.7	419.9	423.2	13
14	426.5	429.8	433.1	436.4	439.6	442.9	446.2	449.5	452.8	456.0	14
15	459.3	462.6	465.9	469.2	472.4	475.7	479.0	482.3	485.6	488.8	15
16	492.1	495.4	498.7	502.0	505.2	508.5	511.8	515.1	518.4	521.7	16
17	524.9	528.2	531.5	534.8	538.1	541.3	544.6	547.9	551.2	554.5	17
18	557.7	561.0	564.3	567.6	570.9	574.1	577.4	580.7	584.0	587.3	18
19	590.6	593.8	597.1	600.4	603.7	607.0	610.2	613.5	616.8	620.1	19
20	623.4	626.6	629.9	633.2	636.5	639.8	643.0	646.3	649.6	652.9	20
21	656.2	659.4	662.7	666.0	669.3	672.6	675.9	679.1	682.4	685.7	21
22	689.0	692.3	695.5	698.8	702.1	705.4	708.7	711.9	715.2	718.5	22
23	721.8	725.1	728.3	731.6	734.9	738.2	741.5	744.8	748.0	751.3	23
24	754.6	757.9	761.2	764.4	767.7	771.0	774.3	777.6	780.8	784.1	24
25	787.4	790.7	794.0	797.2	800.5	803.8	807.1	810.4	813.7	816.9	25
26	820.2	823.5	826.8	830.1	833.3	836.6	839.9	843.2	846.5	849.7	26
27	853.0	856.3	859.6	862.9	866.1	869.4	872.7	876.0	879.3	882.5	27
28	885.8	889.1	892.4	895.7	899.0	902.2	905.5	908.8	912.1	915.4	28
29	918.6	921.9	925.2	928.5	931.8	935.0	938.3	941.6	944.9	948.2	29
30	951.4	954.7	958.0	961.3	964.6	967.8	971.1	974.4	977.7	981.0	30
31	984.3	987.5	990.8	994.1	997.4	1000.7	1003.9	1007.2	1010.5	1013.8	31
32	1017.1	1020.3	1023.6	1026.9	1030.2	1033.5	1036.7	1040.0	1043.3	1046.6	32
	1049.9	1053.1	1056.4	1059.7	1063.0	1066.3	1069.6	1072.8	1076.1	1079.4	

	0	1	2	3	4	5	6	7	8	9	
33	1082.7	1086.0	1089.2	1092.5	1095.8	1099.1	1102.4	1105.6	1108.9	1112.2	33
34	1115.5	1118.8	1122.0	1125.3	1128.6	1131.9	1135.2	1138.5	1141.7	1145.0	34
35	1148.3	1151.6	1154.9	1158.1	1161.4	1164.7	1168.0	1171.3	1174.5	1177.8	35
36	1181.1	1184.4	1187.7	1190.9	1194.2	1197.5	1200.8	1204.1	1207.3	1210.6	36
37	1213.9	1217.2	1220.5	1223.8	1227.0	1230.3	1233.6	1236.9	1240.2	1243.4	37
38	1246.7	1250.0	1253.3	1256.6	1259.8	1263.1	1266.4	1269.7	1273.0	1276.2	38
39	1279.5	1282.8	1286.1	1289.4	1292.7	1295.9	1299.2	1302.5	1305.8	1309.1	39
40	1312.3	1315.6	1318.9	1322.2	1325.5	1328.7	1332.0	1335.3	1338.6	1341.9	40
41	1345.1	1348.4	1351.7	1355.0	1358.3	1361.5	1364.8	1368.1	1371.4	1374.7	41
42	1378.0	1381.2	1384.5	1387.8	1391.1	1394.4	1397.6	1400.9	1404.2	1407.5	42
43	1410.8	1414.0	1417.3	1420.6	1423.9	1427.2	1430.4	1433.7	1437.0	1440.3	43
44	1443.6	1446.9	1450.1	1453.4	1456.7	1460.0	1463.3	1466.5	1469.8	1473.1	44
45	1476.4	1479.7	1482.9	1486.2	1489.5	1492.8	1496.1	1499.3	1502.6	1505.9	45
46	1509.2	1512.5	1515.7	1519.0	1522.3	1525.6	1528.9	1532.2	1535.4	1538.7	46
47	1542.0	1545.3	1548.6	1551.8	1555.1	1558.4	1561.7	1565.0	1568.2	1571.5	47
48	1574.8	1578.1	1581.4	1584.6	1587.9	1591.2	1594.5	1597.8	1601.0	1604.3	48
49	1607.6	1610.9	1614.2	1617.5	1620.7	1624.0	1627.3	1630.6	1633.9	1637.1	49
50	1640.4	1643.7	1647.0	1650.3	1653.6	1656.8	1660.1	1663.4	1666.7	1669.9	50
51	1673.2	1676.5	1679.8	1683.1	1686.4	1689.6	1692.9	1696.2	1699.5	1702.8	51
52	1706.0	1709.3	1712.6	1715.9	1719.2	1722.4	1725.7	1729.0	1732.3	1735.6	52
53	1738.8	1742.1	1745.4	1748.7	1752.0	1755.2	1758.5	1761.8	1765.1	1768.4	53
54	1771.7	1774.9	1778.2	1781.5	1784.8	1788.1	1791.3	1794.6	1797.9	1801.2	54
55	1804.5	1807.8	1811.0	1814.3	1817.6	1820.9	1824.1	1827.4	1830.7	1834.0	55
56	1837.3	1840.6	1843.8	1847.1	1850.4	1853.7	1857.0	1860.2	1863.5	1866.8	56
57	1870.1	1873.4	1876.6	1879.9	1883.2	1886.5	1889.8	1893.0	1896.3	1899.6	57
58	1902.9	1906.2	1909.4	1912.7	1916.0	1919.3	1922.6	1925.9	1929.1	1932.4	58
59	1935.7	1939.0	1942.3	1945.5	1948.8	1952.1	1955.4	1958.7	1961.9	1965.2	59
60	1968.5	1971.8	1975.1	1978.3	1981.6	1984.9	1988.2	1991.5	1994.8	1998.0	60
61	2001.3	2004.6	2007.9	2011.1	2014.4	2017.7	2021.0	2024.3	2027.6	2030.8	61
62	2034.1	2037.4	2040.7	2044.0	2047.2	2050.5	2053.8	2057.1	2060.4	2063.6	62
63	2066.9	2070.2	2073.5	2076.8	2080.1	2083.3	2086.6	2089.9	2093.2	2096.5	63
64	2099.7	2103.0	2106.3	2109.6	2112.9	2116.1	2119.4	2122.7	2126.0	2129.3	64
65	2132.5	2135.8	2139.1	2142.4	2145.7	2149.0	2152.3	2155.5	2158.8	2162.1	65
66	2165.4	2168.6	2171.9	2175.2	2178.5	2181.8	2185.1	2188.3	2191.6	2194.9	66

1 centimetre = 0.393701 inches

TABLE 9. KILOMETRES TO STATUTE MILES

1 kilometre = 0.621372 miles

[illegible]

TABLE 12. SQUARE KILOMETRES TO SQUARE MILES

1 square kilometre = 0.386103 square miles

	0	1	2	3	4	5	6	7	8	9	
..	..	0.386	0.772	1.158	1.544	1.931	2.317	2.703	3.089	3.475	..
1	3.861	4.247	4.633	5.019	5.405	5.792	6.178	6.564	6.950	7.336	1
2	7.722	8.108	8.494	8.880	9.266	9.653	10.039	10.425	10.811	11.197	2
3	11.583	11.969	12.355	12.741	13.128	13.514	13.900	14.286	14.672	15.058	3
4	15.444	15.830	16.216	16.602	16.989	17.375	17.761	18.147	18.533	18.919	4
5	19.305	19.691	20.077	20.463	20.850	21.236	21.622	22.008	22.394	22.780	5
6	23.166	23.552	23.938	24.324	24.711	25.097	25.483	25.869	26.255	26.641	6
7	27.027	27.413	27.799	28.186	28.572	28.958	29.344	29.730	30.116	30.502	7
8	30.888	31.274	31.660	32.047	32.433	32.819	33.205	33.591	33.977	34.363	8
9	34.749	35.135	35.521	35.908	36.294	36.680	37.066	37.452	37.838	38.224	9
10	38.610										10

TABLE 13. CUBIC METRES TO CUBIC FEET

1 cubic metre = 35.3148 cubic feet

	0	1	2	3	4	5	6	7	8	9	
..	..	35.315	70.630	105.944	141.260	176.574	211.889	247.204	282.518	317.833	..
1	353.148	388.463	423.778	459.092	494.407	529.722	565.037	600.352	635.666	670.981	1
2	706.296	741.611	776.926	812.240	847.555	882.870	918.185	953.500	988.814	1024.129	2
3	1059.444	1094.759	1130.074	1165.388	1200.703	1236.018	1271.333	1306.648	1341.962	1377.277	3
4	1412.592	1447.907	1483.222	1518.536	1553.851	1589.166	1624.481	1659.796	1695.110	1730.425	4
5	1765.740	1801.055	1836.370	1871.684	1906.999	1942.314	1977.629	2012.944	2048.258	2083.573	5
6	2118.888	2154.203	2189.518	2224.832	2260.147	2295.462	2330.777	2366.092	2401.406	2436.721	6
7	2472.036	2507.351	2542.666	2577.980	2613.295	2648.610	2683.925	2719.240	2754.554	2789.869	7
8	2825.184	2860.499	2895.814	2931.128	2966.443	3001.758	3037.073	3072.388	3107.702	3143.017	8
9	3178.332	3213.647	3248.962	3284.276	3319.591	3354.906	3390.221	3425.536	3460.850	3496.165	9
10	3531.480										10

1 metric ton = 0.984207 ton

[illegible]

TABLE 17. QUINTALS PER HECTARE TO TONS PER ACRE

1 quintal per hectare = 0.0398294 ton per acre

[illegible]

TABLE 19. DEGREES CENTIGRADE TO DEGREES FAHRENHEIT

1° Centigrade = 1.8° Fahrenheit

<i>Centigrade minus</i>										
	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9
-2	-4.0	-5.8	-7.6	-9.4	-11.2	-13.0	-14.8	-16.6	-18.4	-20.2
-1	14.0	12.2	10.4	8.6	6.8	5.0	3.2	1.4	-0.4	-2.2
..	32.0	30.2	28.4	26.6	24.8	23.0	21.2	19.4	17.6	15.8
..	32.0	33.8	35.6	37.4	39.2	41.0	42.8	44.6	46.4	48.2
+ 1	50.0	51.8	53.6	55.4	57.2	59.0	60.8	62.6	64.4	66.2
+ 2	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2
+ 3	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
+ 4	104.0	105.8	107.6	109.4	111.2	113.0	114.8	116.6	118.4	120.2
+ 5	122.0	123.8	125.6	127.4	129.2	131.0	132.8	134.6	136.4	138.2
+ 6	140.0	141.8	143.6	145.4	147.2	149.0	150.8	152.6	154.4	156.2
+ 7	158.0	159.8	161.6	163.4	165.2	167.0	168.8	170.6	172.4	174.2
+ 8	176.0	177.8	179.6	181.4	183.2	185.0	186.8	188.6	190.4	192.2
+ 9	194.0	195.8	197.6	199.4	201.2	203.0	204.8	206.6	208.4	210.2
+ 10	212.0									
<i>Centigrade plus</i>										
	0	1	2	3	4	5	6	7	8	9
..
+ 1	..	33.8	35.6	37.4	39.2	41.0	42.8	44.6	46.4	48.2
+ 2	..	51.8	53.6	55.4	57.2	59.0	60.8	62.6	64.4	66.2
+ 3	..	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2
+ 4	..	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
+ 5	..	105.8	107.6	109.4	111.2	113.0	114.8	116.6	118.4	120.2
+ 6	..	123.8	125.6	127.4	129.2	131.0	132.8	134.6	136.4	138.2
+ 7	..	141.8	143.6	145.4	147.2	149.0	150.8	152.6	154.4	156.2
+ 8	..	159.8	161.6	163.4	165.2	167.0	168.8	170.6	172.4	174.2
+ 9	..	177.8	179.6	181.4	183.2	185.0	186.8	188.6	190.4	192.2
+ 10	..	195.8	197.6	199.4	201.2	203.0	204.8	206.6	208.4	210.2

TABLE 20. PRESSURE: EQUIVALENTS OF MILLIBARS, MILLIMETRES OF MERCURY, AND INCHES OF MERCURY AT 32° F. IN LATITUDE 45°

Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.	Mercury in.	Milli- bars	Mercury mm.
27.02	915	686.3	27.82	942	706.6	28.62	969	726.8	29.41	996	747.1
27.05	916	687.1	27.85	943	707.3	28.65	970	727.6	29.44	997	747.8
27.08	917	687.8	27.88	944	708.1	28.67	971	728.3	29.47	998	748.6
27.11	918	688.6	27.91	945	708.8	28.70	972	729.1	29.50	999	749.3
27.14	919	689.3	27.94	946	709.6	28.73	973	729.8	29.53	1,000	750.1
27.17	920	690.1	27.97	947	710.3	28.76	974	730.6	29.56	1,001	750.8
27.20	921	690.8	28.00	948	711.1	28.79	975	731.3	29.59	1,002	751.6
27.23	922	691.6	28.03	949	711.8	28.82	976	732.1	29.62	1,003	752.3
27.26	923	692.3	28.05	950	712.6	28.85	977	732.8	29.65	1,004	753.1
27.29	924	693.1	28.08	951	713.3	28.88	978	733.6	29.68	1,005	753.8
27.32	925	693.8	28.11	952	714.1	28.91	979	734.3	29.71	1,006	754.6
27.35	926	694.6	28.14	953	714.8	28.94	980	735.1	29.74	1,007	755.3
27.38	927	695.3	28.17	954	715.6	28.97	981	735.8	29.77	1,008	756.1
27.41	928	696.1	28.20	955	716.3	29.00	982	736.6	29.80	1,009	756.8
27.44	929	696.8	28.23	956	717.1	29.03	983	737.3	29.83	1,010	757.6
27.46	930	697.6	28.26	957	717.8	29.06	984	738.1	29.86	1,011	758.3
27.49	931	698.3	28.29	958	718.6	29.09	985	738.8	29.89	1,012	759.1
27.52	932	699.1	28.32	959	719.3	29.12	986	739.6	29.92	1,013	759.8
27.55	933	699.8	28.35	960	720.1	29.15	987	740.3	29.94	1,014	760.6
27.58	934	700.6	28.38	961	720.8	29.18	988	741.1	29.97	1,015	761.3
27.61	935	701.3	28.41	962	721.6	29.21	989	741.8	30.00	1,016	762.1
27.64	936	702.1	28.44	963	722.3	29.24	990	742.6	30.03	1,017	762.8
27.67	937	702.8	28.47	964	723.1	29.26	991	743.3	30.06	1,018	763.6
27.70	938	703.6	28.50	965	723.8	29.29	992	744.1	30.09	1,019	764.3
27.73	939	704.3	28.53	966	724.6	29.32	993	744.8	30.12	1,020	765.1
27.76	940	705.1	28.56	967	725.3	29.35	994	745.6	30.15	1,021	765.8
27.79	941	705.8	28.59	968	726.1	29.38	995	746.3	30.18	1,022	766.6

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C^{ie} = Compagnie; St. = Saint; Ste. = Sainte; stn. = station.

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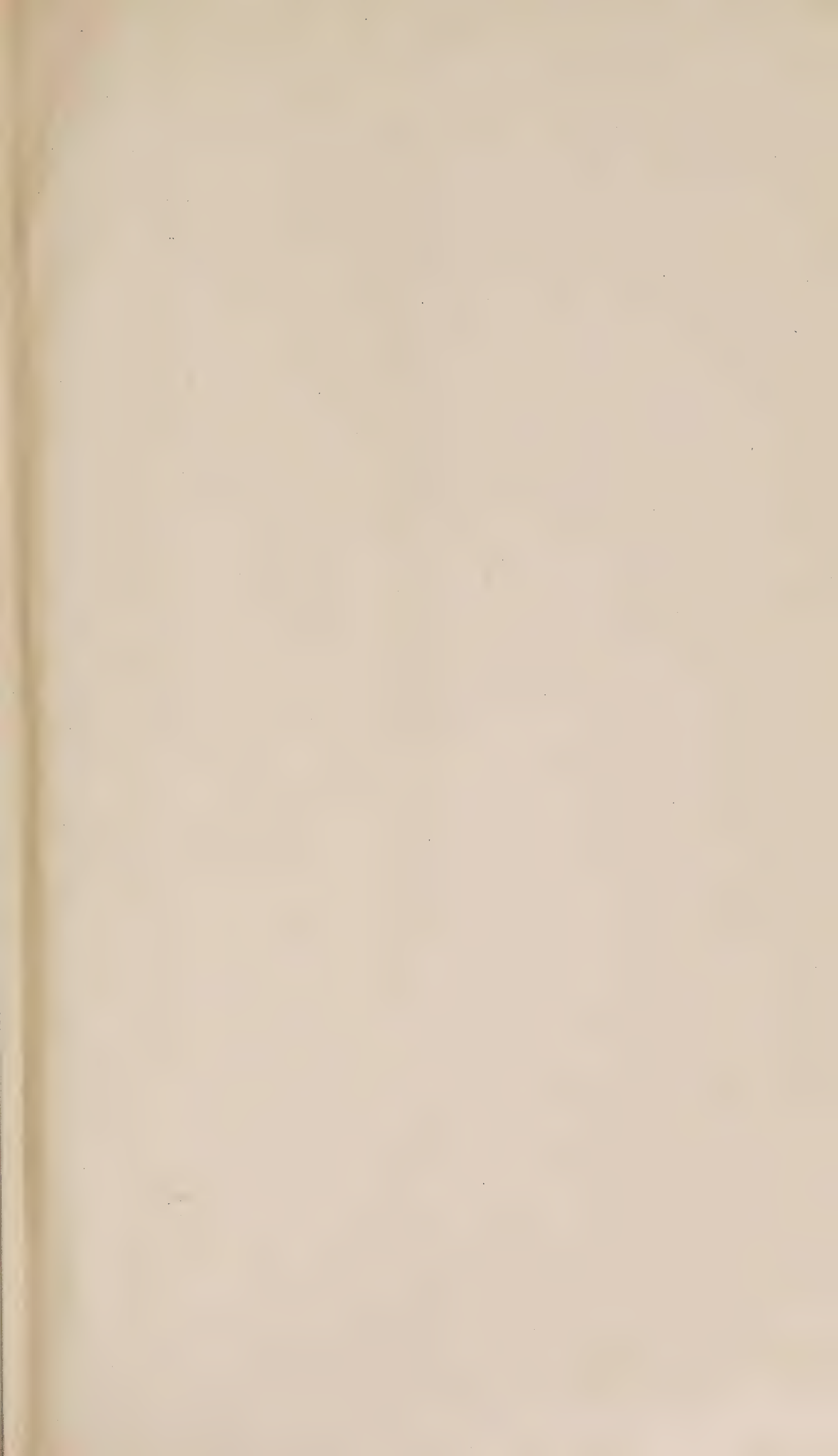
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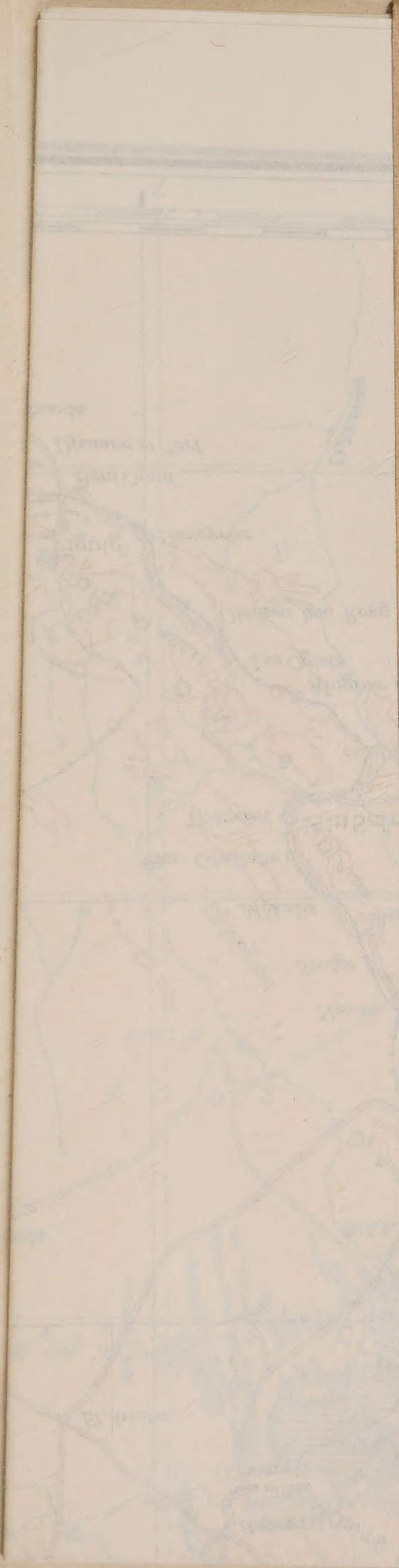
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